

# The MILLING WORLD

and CHRONICLE OF THE GRAIN and FLOUR TRADE.

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## BLAIR & AULD'S MILL, ATCHISON, KAN.

IF new mills are built in localities unfavorably situated with regard to transportation facilities and easy access to markets, we are apt to predict a short life to such establishments. When, however, a modern mill is erected in a rapidly growing community, in a State where everything seems to combine to enable such mill to enter into active competition with older business enterprises of a similar kind, we are forced to acknowledge the foresight of the builders for selecting so favorable a locality where success is almost certain to attend such an enterprise.

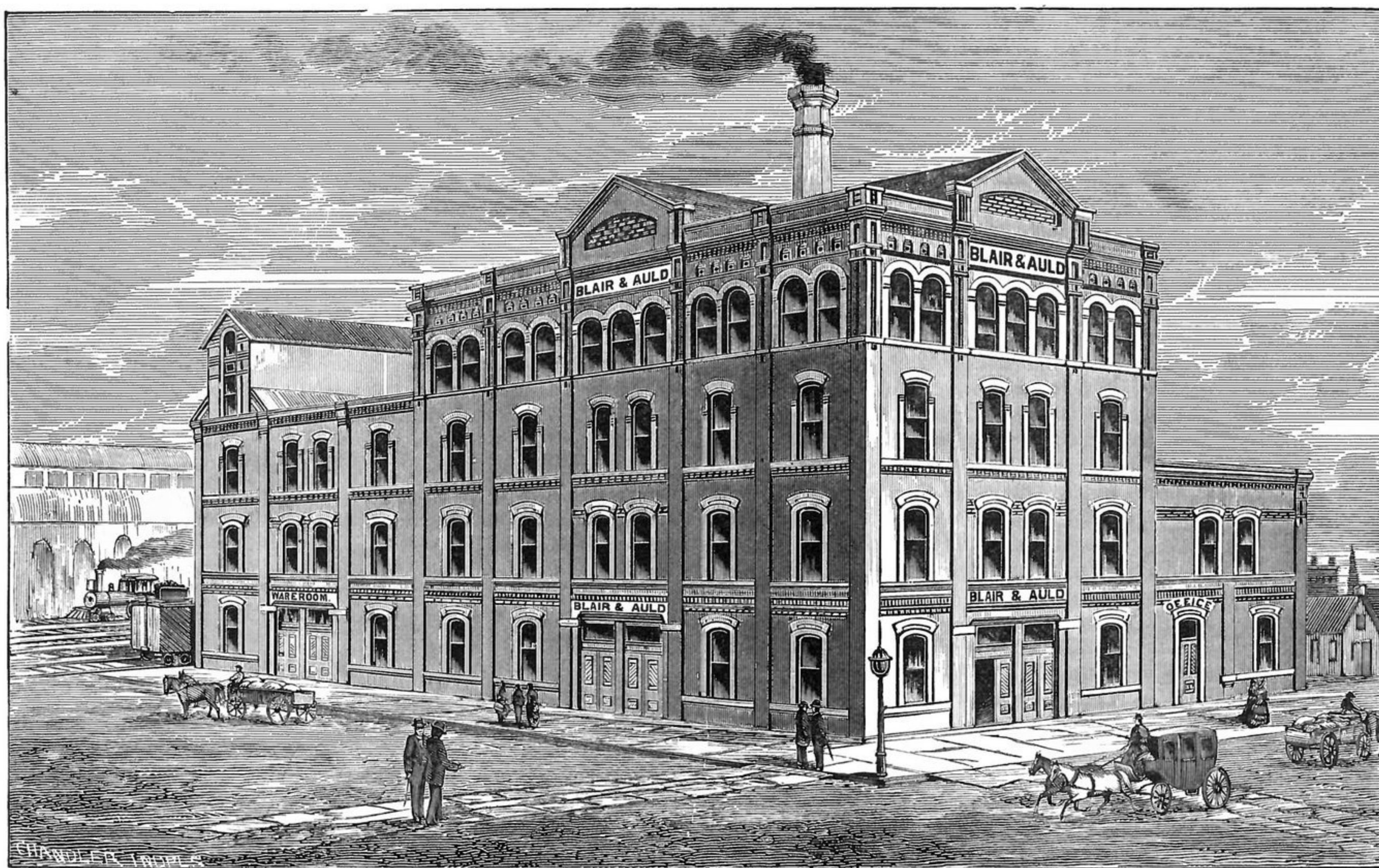
The knowledge that the transportation of flour is cheaper than that of grain is build-

tem. As conscientious millers and careful business men, the products of their mills, under any form, have always found a ready market on account of their uniform excellence. The mill building is of a tasteful design, of brick, with heavy stone trimmings, and its situation is conspicuous as well as convenient, in the vicinity of the Atchison Union Depot. The offices, packing room and elevator are kept apart from the main building in a wing which has been built for that purpose. The engine room is built separately from the mill and contains a 100-horse power automatic engine, handsomely trimmed, which in addition to its exterior beauty holds claim to the capacity of generating one horse power per hour by the use of only three pounds of coal.

Thirteen of Nordyke & Marmon's roller mills are arranged in two lines on the grind-

time, even if I had sufficient knowledge to entertain you with a discussion as to the respective merits of high and low reduction, of rollers versus stones. The City and Guilds Institute of London a few years ago established examinations in the chemistry of bread-making, and due chiefly to the active aid of Mr. Dunham, the proprietor of "The Miller" newspaper, and also aided by active millers taking a keen interest in their trade, they have recently added milling to their curriculum of examination. You are probably most of you aware that the City and Guilds Institute carry on in technology much the same kind of examinations, although I hope better in character, that the Science and Art Department do throughout England, Scotland, and Ireland in their May Science Examinations. Milling has been given to those interested in milling,

has this injurious action on the fermentation, that it produces too great a quantity of maltose sugar and dextrine, and introduces also too large a quantity of soluble albuminoids into the bread, which soluble albuminoids, not the starch, as some people imagine, give high color in the oven. Degermination and elimination of the bran are, I hold, tests of the highest milling, whether it be by rollers or by stones. For brown bread and for whole-meal bread there is a difference, and I will later on point out how we may to some extent eliminate or obviate the difficulties when we employ brown flour or whole-meal flour. A very important point is the admixture of wheats; formerly millers were obliged to use the wheats as they could find them in their own country, but now we have excellent wheats from the United States, from Canada, from the Black Sea,



BLAIR & AULD'S MILL, ATCHISON, KANSAS.

ing up a number of mills in the heart of the grain producing states; and the eastern cities of Kansas have, during the past few years, received quite an addition to their industrial activity by the erection of several first-class milling establishments. The accompanying illustration represents the latest addition to the milling industry of Kansas; the new mill of Messrs. Blair & Auld, at Atchison, recently built by the Nordyke & Marmon Co., of Indianapolis, Ind. Messrs. Blair & Auld have been engaged in the milling business for seventeen years and have kept pace with the progress of the times. They have made flour when the old system was in vogue; changed into the new process milling system after its superiority had been established; and the same spirit of progress and enterprise has now developed this present fine mill with a full roller sys-

ing floor, and are driven by two lines of shafts. Five flour packers find room along the wall. The mill makes seven breaks on wheat; the bran from the tail of the seventh break scalper is sent to a bran duster, and the resulting flour is dressed on a centrifugal. Ten scalping reels, fourteen flouring reels, seven middlings purifiers provided with improved dust collectors, also four large centrifugals and two bran dusters occupy the upper floors of the four story mill building. The capacity of the mill ranges from 200 to 250 barrels per day. The total cost was about \$40,000.

### CHEMISTRY OF BREAD-MAKING.

II.

Prof. Graham, in *The Miller*.

I proceed now to the subject of milling. I am not a miller, and I have not sufficient

and in looking over the character of the questions set I am bound to say that in a very short time it must stimulate the young millers to study, not merely the chemistry of their art, but to study the engineering part of their profession in a way that has not been hitherto done in our country, and therefore I think that the City and Guilds Institute will do considerable good in this direction.

As a chemist, however, and as I am lecturing upon the best means of preparing wheat bread fit to compare with the beautiful bread of Moscow or Paris, I think the following conditions are essential to be aimed at in good milling. In the first place, the corn must be degerminated, because the germ is an active hydrating and diastasis body; secondly, the bran must be thoroughly eliminated, because the cerealine of the bran

from Australia, and lastly and not of the least interest, from India and Persia. I read a statement in a newspaper recently that the Indian Government had been making an investigation into the question of the expense of growing wheat in India, and they find the natives can grow wheat for 12s. a quarter—16s. will leave a profit. Some objection has been made to the employment of too large a quantity of Indian wheats when mixed with our own, owing, it is said, although I have not noticed it myself, to the aromatic flavor of bread that has had too large a proportion of Indian wheat ground with our English or other wheats. This is, however, a matter that the miller can readily obviate by a little attention to the admixture, and by not using perhaps quite so much of the Indian wheats. At the present moment we are able to get



excellent wheats as low as 32s. per quarter. Now I remember at a dinner, I think it was in 1872, the motto of the Royal Agricultural Society of England was given as a toast after dinner, that motto being "Practice with Science;" and I was associated, being a scientific man, with a practical farmer in replying to that toast. In my reply I referred to some of the advantages of science; but then, speaking to British farmers, I pointed out some of the disadvantages of science; I pointed out how by using both high and low pressure steam on board ship, as Elder was beginning to do, with the development of the railway carrying powers of America, the United States farmer would in a very few years be able to sell wheat at a profit at 40s. per quarter at Liverpool, not only were they very incredulous, but they laughed at me; but to-day you can get it at 32s. per quarter, and this is not entirely due to the great activity of the Americans in growing wheat; the fact is, that the great wheat speculators in America were not aware of the enormous amount of wheat that India can send to us. This great speculation in wheat, what they call the "wheat ring," has broken down completely, and we are able, thanks chiefly to India, to have wheat at this very low price. It is an additional satisfaction to an Englishman that South Australia, New Zealand, and also India, have a large wheat-growing capacity, because in India free trade is the rule, whereas the Americans are protectionists, and by our purchasing large quantities of wheat from India, we may expect, of course, that they will take large quantities of our manufactured products, hardware and cotton, from us in exchange, so that in that way from our colonies and from India we shall not only have cheap wheat, cheap flour for some time to come, but also have the prospect of a better condition of our manufacturing industries.

The miller's method of testing wheats consists in judging by their appearance, by the weight per bushel, by the country in which they are grown, and lastly by grinding and baking some. A distinguished baker in Paris, M. Bolland, adopted a method by which he separated the gluten from the flour, and this gluten was put into a tube, and the tube put into the oven, and according to the amount of expansion of the gluten, so did he decide upon the quantity of the gluten there, and its resisting action to steam—in other words, he judged in that way of the goodness of the flour for the fermenting process of making bread.

The plan which I suggested some time ago was this, that one ounce of flour should be mixed with four ounces of water, and allowed to stand at the temperature of about 80° or 85° for two hours; that it should then be filtered; the first portion of the filtrate will be a little thick, but the latter portion will not be so thick. You put this into a test tube, which you have previously marked at one ounce and two ounces; it is filled up to one ounce, and then is mixed with one ounce of strong methylated alcohol, which we can get for about 5s. a gallon; the result is this, that you obtain a precipitation of most of the soluble matters, of maltose of dextrine, and the soluble albuminoids; and according to the amount of precipitation, so you would decide as to the amount of soluble matter that would be produced during the sponge stage of bread-making.

I proceed now to consider the question of bread-making. The ways of making bread are very numerous in different parts of the country. I will therefore limit myself solely to the London system of bread-making, which is one of the best. The London system consists of three parts—the preparation of the ferment, the preparation of the sponge, and the preparation of the dough. A sack of flour is 280 lbs. in weight, and it should yield from 94 to 96 quarter loaves. In the

preparation of the ferment, 6 lbs. to 8 lbs., some times as much as 12 lbs., of the very best potatoes are employed; inferior potatoes will not do. These are thoroughly cleansed, washed, cut up and boiled, and then when made into a thin paste they are poured into a tub, and cold water added until the temperature is lowered to 85 deg. When this is done, about 2 lbs. of flour are added, and then one quart of good brewers yeast stirred in; this is the preparation of the "ferment;" fermentation begins, the yeast acts upon the albuminoids of the wheat, and the albuminoids of the wheat so acted upon act then upon the starch of the boiled potato, and the result is we have maltose sugar and dextrine, and peptone bodies formed. After five hours, the time depending on the temperature, the head falls and then the ferment is allowed to rest for about two hours. The baker then proceeds to the next stage, which is the preparation of the sponge, or "stirring the sponge." In making the sponge one-fourth, or according to some bakers one-third, of the flour is taken, placed in the trough, the ferment added through a sieve which retains the potato-skins, the water in the ferment and sponge being about thirty quarts; bear in mind I am always speaking of the sack of 280 lbs. of flour. The quantity of water, however, varies slightly with the kind of flour and slightly with the baker's own particular practice. The other ingredient is salt. Now many London bakers do not use salt in the sponge stage, nor is it needful in the very highest classes of flour; others, however, prefer to use some of the salt, and the quantity of salt therefore used in this stage varies. The amount altogether used for a sack of flour is 3 lbs., or 48 ozs., that is, ½ oz. for each quarter loaf. Now salt acts as a check upon fermentation. The more salt you add to the sponge stage the more you check the degradation or breaking up of the albuminoids. The sponge being made ferments, and in about five hours it breaks, carbonic acid being given off, and in an hour it rises again, and again breaks. This last will depend on the temperature.

After the second break, the remainder of the flour, be it three-fourths or two-thirds, according to the practice of the baker, and the remaining portion of the water, is added; the total quantity of water for the whole sack is 60 quarts. These are thoroughly mixed together, and in the dough stage many bakers, as I said, add the whole of the salt. Those, of course, who have used part of the salt in the sponge stage simply add the remainder. Of late years machinery has been invented to do away with the manual labor and other objections to the mixing of the dough; it is very hard work, and I should be glad for those of you who have time to look not only at the very useful mixing machine of Mr. Pfeiderer, but also to look at the mixing machine of Melvin of Glasgow, in Mr. Marshall's model bakery, which consists of a number of revolving cutters which mix in the dough. The dough well mixed is then left for an hour, it rises, it is then scaled, that is to say, weighed and put in the oven, where it remains for one hour and a half, the atmosphere of the oven being about 400 deg. to 450 deg. The temperature of the bread, I need hardly say, is not 400 deg., but much less, appreciably not more than 212 deg., but it may be a little over, owing to the resisting action of the crust, but at that temperature you know water boils, and therefore the temperature could not be higher.

Before I pass on to a description of the scientific phenomena underlying these processes, I will briefly refer to the manufacture of fancy bread. Bakers, of course, differ in their manufacture of fancy bread in the same way as they do with ordinary household bread, but the following will give you an idea of the general method. In the first place a "ferment" is prepared as before

that is to say boiled potato with a small quantity of flour, and with brewer's yeast. Having prepared the ferment: in the sponge state, the baker uses a large quantity of German yeast, and in this way he gets a very rapid fermentation and a large, light porous bread. In regard to the chemistry of these operations, the fruit, that is to say, the boiled potato, yields ferment food, and thereby, by the action of the yeast on the soluble albuminoids of the flour, gives a rapid formation of maltose and dextrine. In eight lbs. of potatoes there are only two lbs. of starch, so manifestly the baker does not use this small quantity for the sake of cheapness. It is because it is one of the largest of all starches, and therefore it is one of the best means of preparing albuminoid and sugar food for the active stimulus of yeast growth. The ferment stage increases the production of these albuminoids and sugars, and the yeast is in this way greatly stimulated; but another object that I ought to mention that the London baker has in making this preparation of the ferment is that he largely increases the amount of yeast. This method of feeding yeast during this number of hours, is a method of making a considerable amount of yeast out of the one quart that he takes.

In the sponge state we have a very active fermentation going on; the sugar there is broken up into carbonic acid, and alcohol, and there is a rapid action; and it is in this particular stage which lasts so many hours that inferior flours turn out so badly, because they produce more and more soluble albuminoids, and these give a high color to the final product. In the dough state, which is practically the inert stage, because in the dough stage we have added all the flour, and only thirty more quarts of water; we have also a less period of time allowed, only one hour, and the result is that very little further change goes on. If the flour has withstood the sponge stage without injurious result, it will perfectly well stand the dough stage. The objects aimed at by the baker being to obtain the good aeration, numerous small cavities of gas, in other words to give a well-piled loaf, also to avoid color, because color always gives rise to a suspicion of inferiority of the flour; and lastly, the baker's aim is to obtain a nice aroma, a fine nutty taste, such as indeed cannot be got by any other method than that which I have been describing.

#### BAKING EXPERIMENTS WITH FLOURS FROM VARIOUS SOURCES.

The experiments of the McDougall Bros. in London, in the autumn of 1882, upon the baking qualities of flour made from wheats in the English market from different parts of the world, have had a wide circulation. The statistician of the United States Department of agriculture in his report upon the condition of the crops for December, 1883, mentions and quotes them as follows:

In the autumn of 1882 the Secretary of State of India arranged with McDougall Bros., millers and bakers, London, to conduct a series of experiments with wheats from India in comparison with average samples of wheat from the principal countries producing this grain. Of the conditions required by the Secretary they say:

"1. That we should take a given quantity of each of these four representative Indian wheats, viz., Indian fine soft white, Indian superior soft red, Indian average hard white, Indian average hard red, and manufacture them into flour by the ordinary process of grinding under millstones. Also that we should take similar quantities of the same wheats and manufacture them into flour by means of crushing between rollers, according to the system known as the Hungarian or roller system. 2. That we should take a given quantity of each flour so produced

and manufacture it into bread. 3. That we should note the qualities and other characteristics of the flours produced, also of the offals, viz., middlings, pollard, and bran. 4. That we should procure the following representative wheats of fair average quality of the season, as then being sold on Mark Lane market, and, for the purpose of obtaining results for comparison, deal with them precisely as above indicated, both as regards flour, bread, and offals, viz., English average, American red winter, American spring, Australian average, California average, Russian Saxonska, Russian Taganrog, Russian Kubavka, Russian Ghirka, Egyptian Bui, and Egyptian Saida."

The quantity used in each case was 5,000 pounds. The samples varied in weight from 57½ lbs. per bu. for the Saida Egyptian to 64 pounds for the soft Indian white variety. The weight of the separate "berries" varied greatly; those of American spring were smallest of all, 100 weighing 35.5 grains; California, 47.7 grains. The Australian were heaviest, 80.5 grains; Indian, from 51.8 to 77.7 grains. The Saxonska Russian was 37.3 grains, next to American spring the smallest, and containing the most gluten, 23.2 per cent.; yet the size appears to be no indication of the proportion of gluten in other samples, as the heaviest, the Australian, averaged 11.6 per cent., and the poorest in gluten, bearing only 4.4 per cent., was of medium weight, 50.1 for 100.

The manufacture of bread from Indian wheats by the millstone and also the roller process, and from other samples by the roller method, was next undertaken. The quantities used in each case were 280 pounds of flour, 30 pounds of liquid potato ferment, one pound of French yeast, and 8½ pounds of salt. The table is as follows:

Wheat.	Water used.	Yield of bread when cold.	Percentage of bread to flour.	Percentage of water to flour.	Color, exterior.	Color, interior.	Flavor.	Texture.	General characteristics.
Indian (fine soft white)	141.4	364.0	130.0	50.5	10	11	4	6	4
Do.	141.6	367.5	131.2	53.4	13	13	4	6	4
Indian (superfine soft white)	141.6	372.0	133.0	50.6	8	10	4	6	4
Do.	149.0	382.0	133.3	52.3	12	13	4	6	4
Indian (average hard white)	141.0	370.5	132.4	50.8	10	9	4	6	4
Do.	149.6	385.0	130.3	53.4	6	7	4	6	4
Indian (average hard red)	145.2	376.6	134.5	51.8	9	9	4	6	4
Do.	147.4	385.0	130.3	52.2	9	9	4	6	4
English	130.0	352.0	125.7	48.0	12	12	12	10	11
Australian	131.6	355.4	126.9	46.4	13	12	12	10	11
New Zealand	132.0	349.0	124.6	47.1	12	12	12	9	10
California	136.8	364.0	130.0	48.9	12	12	12	10	11
American, winter	130.0	346.0	123.5	46.4	13	12	12	10	11
Spring	130.0	354.0	126.4	46.4	8	10	9	12	12
Russian, Saxonska	130.0	356.0	127.1	46.4	11	11	9	12	12
Hard Taganrog	145.4	354.5	126.6	51.9	6	6	4	6	4
Egyptian, Bui	136.8	382.0	129.3	48.9	7	6	4	6	4
Saida	144.4	388.0	137.7	51.6	6	6	4	6	4

Whether the Indian wheats were average samples of the product of that country, or a little better through the unconscious partiality of the secretary, may be questionable. They make a good showing for quantity of product, but the quality of the soft wheat is quite inferior to that of samples from this country. In the United States, California appear to take the lead in quantity of bread, while the spring wheats of the Northwest not only surpass other American samples in quality, but are unequalled in that respect by any wheats included in this experiment, the Russian only excepted, which excel in gluten.

The following statement relative to the effect of dryness of the grain upon the yield of bread is extracted from this report: "It is generally believed that upon the percentage of gluten in flour depends the yield of bread that may be obtained from it, as illustrated



by the Hungarian flours, which are almost unequalled for yield of bread, and rank high in gluten: but this is erroneous, as proved by the experimental workings now under review. It would be found that the flours high in gluten do not produce the most bread, unless, at the same time, they possess a hide degree of dryness, for it is upon the dryness of the flour that the yield of bread mainly depends, and not upon the gluten. The two lots of flour from Russian wheats (Nos. 11 and 12) are those which are highest in gluten yet they do not yield as much bread as any of the four Indian wheats (Nos. 1 to 4), and the difference in yield from the latter would have been still further increased had they not been previously mellowed with water, as noted, before milling; confirming that it is the dryness of a flour that determines the yield of bread."

There being considerable doubt as to whether the samples of American wheats in the preceding experiments were representative, a series of baking experiments with flours of various grades from different parts of this country have been carried on in the laboratory of the Department of Agriculture, with the following results, which are presented by Prof. Richardson, in Bulletin No. 4 of the Department.

The McDougall Bros. found, and it has been confirmed by us, that upon the dryness of a flour, or upon the amount of water which it is possible to add to the dough, depends chiefly the amount of bread which it will yield. Unfortunately no determination of the amount of moisture in the flours used was made in the English tests. In our experiments, using the same flour under various conditions, it was found possible to vary the yield of bread per 100 pounds of flour as much as 15 pounds. The conditions upon which this variation depends are largely physical, and include: Percentage of water used in the dough, size of the loaves, temperature of the oven, time of baking.

Of course in any series of comparative experiments three conditions must be closely observed and regulated. In order to learn the best modifications for our work, a preliminary series was undertaken with a flour from Ohio. In the beginning it was found that a dough made with any of our flours and as small a percentage of water as was used by the McDougalls would be altogether too stiff for successful results.

#### DIVISION OF LABOR.

From the Austrian Journal of Commerce.

The industrial progress of the most recent times is due principally to the constantly growing tendency towards a division of labor. The consequence of this is an increasing number of specialists and special tools and machinery. It is a well known fact that a strict division of labor is of the utmost importance for the success of our manufacturing interest as well as for the cheapness and quality of products. The advantages to be derived from such a system are apparent, although our whole civil life has been changed in consequence thereof. The old trades, which flourished for centuries, have either disappeared entirely, or have been so modified as to be almost beyond recognition. Such a wholesale destruction of ancient notions has made many enemies to the new system, but they are powerless to stem the tide of advance. The cause for such opposition is not so much a consideration of the disadvantages derived from this division of labor to the welfare of the individual, as the clumsiness of a few, who are apparently unable to adapt themselves to the changed conditions and cling with persistency to ancient forms. On the other side, this division of labor offers valuable means for improvement to the intelligent artisan, which were beyond his reach in the working of the old system. Of course it is not an easy matter to find

the right road at the outset under the new conditions, and many are the mistakes made. While during time, when trades where in the height of their glory, every artisan considered it the object of his life to learn everything pertaining to his trade and to attain the highest efficiency possible in its execution, we find that the present time confines the artisan to a more limited sphere if he desires to keep up with his fellow-laborers. This would appear to be a step backward, but it is due to the immense development of the different trades during the present century, which make it an impossibility for one man to grasp all the details, even if he cares to remain an apprentice the largest portion of his life.

It is as much to the interest of society as to the individual, that everybody should cultivate his abilities to the utmost, and for this reason there is no limit to the development of the theoretical knowledge of artisans. The capacity of the human mind, however is limited, likewise the time for study, and therefore the average man has to be satisfied with a lower stage of knowledge. Among savage races the necessities of life are few and simple, and every individual is almost enabled to live independently of his fellow-beings. In modern life that would be impossible and such a universal independence cannot be attained; theoretically the idea appears sublime to have all men equally cultivated, but practically our social and industrial conditions are far too complicated and will never allow the realization of such theories.

The progress of the present age does not consist of a generalization of the individual's knowledge, but of its specialization. The division of labor forms here an important aid, and can even be looked upon as the final goal of ambition, as long as the specialization is accepted in the proper light, not as a means to retard, but as a means to advance the intellectual capacity of the individual. Industry has expanded not only in quantity, but also in diversity of the separate processes and manipulations, and, in its present form, it cannot exist without the division of labor, even to such an extent, that in many cases the individual artisan forms only a living link in a large chain of industrial processes, a very insignificant part of a combination of men and machinery without the slightest recognition of his own personal individuality.

Under such conditions it is immaterial whether the ideal artisan is able to execute the most manifold works; the point is that he should be competent to do a certain definite work better and quicker than anybody else. Such an ability can be acquired only by application to the one particular line of work. The inevitable result of such one-sided labor is the restriction of the other capacities; in this way the division of labor is injurious, because it degrades the man to a mere machine. But thinking people do not stop at that; an individual desire to advance soon opens the road for improvements in the machinery and for additional inventions to supplant the needed human machine by one of wood and iron.

In such a manner the division of labor has become the mother of many important inventions and, above all, of the invention of a large line of special machinery. The fact is that by such means the rough and heavy work is no longer done by the man and he can exercise his abilities in other directions. This abolition of heavy labor is of the utmost advantage for the development of the artisan's mental capacity. In this manner the automatic machines are his best friends. But in addition they reduce the prices of the products and enable him to enjoy advantages never before thought of.

The division of labor has its sunny as well as its shade side. A man who understands the tendency of his age will strive to

derive the greatest benefit from it. But before he selects a specialty he must take a careful view of his surroundings in order to make sure that he has not made a mistake in his selection, for a persistency in mistakes so made, is naturally followed by loss of time and money. It is for the artisan himself to decide whether the division of labor is to be an advantage to him or a disadvantage. If he is satisfied to be an unthinking link in the great chain of machinery, the opportunities for his intellectual advance are small; but, on the other hand, he can attain a fairly independent position by intelligence, perseverance and a fair comprehension of his surroundings.

It is of the greatest importance in this struggle to investigate and take notice of the work of others, and not be too self confident. The artisan must never forget that he, like everybody else, is a part of society, and that it will largely depend upon himself and his labors, whether he will hold an important or an insignificant place among his fellow men. The best method to command recognition is by the careful cultivation of his capacity for some special branch, where his value will be recognized and where he can secure for himself a reputation by improvements made and by the introduction of novelties. He must endeavor to fill his place in the great division of labor not merely as a machine, but must strive to advance the general progress by his intellectual ability, and occupy his place as a thinking man.

#### A CHINESE RAILWAY.

Herr Kiepert gives the following particulars in the Geographical Review, published at Brunswick, of a short line of railway in China which did not share the fate of the line between Shanghai and Woosung. He says that the line in question, which is only seven and a half miles long, and which was constructed almost by stealth, is in the province of Tcheli, and is used for conveying the coal from the mines of Kaiping, situated about seventy miles to the northeast of Tientsin and 105 miles to the east of Peking. The Viceroy Li Hung Chang was anxious that this coal should be used for the Imperial navy, for the arsenals in the province of Tcheli, and for the vessels of the Chinese Merchant Steam Navigation Company, instead of the Japan coal. The simplest plan would, of course, have been to connect Tientsin and Kaiping by means of a railway, but the Chinese would not allow the English engineers who had been called in, to do this, and insisted upon a canal being cut. This canal, which has indirectly been of some service, as it has had the effect of draining the very marshy district through which it is cut, could not be brought right up to the mouth of the mine, so the English engineers were allowed to make a railway over the last few miles. But when the line was made the authorities insisted upon the trucks being drawn by mules, for they would not hear of a locomotive which the engineers of the line had procured being employed. This went on for some time, but they have now given way, and two or three fresh engines have been brought over from England. The Kaiping mine is worked upon very scientific principles, being provided with all the most approved safeguards. The galleries are twenty miles in length, and there are seven miles of tramway. The supply of coal is practically inexhaustible, but the quality of it varies very much, and the Tientsin steamers have to get theirs from Japan. The mine from which they might have got the coal they wanted is only safe with patent lamps, and as the Chinese will always break the glass in order to light their pipes, the workings have been abandoned. The cost of the coal at the pit's mouth is only 9 shillings a ton, so that several manufactories have been established in the neighborhood. The mine gives employment to about 1,000 men.

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Three McCully Corn Cob Crushers. The above articles are brand new, in perfect condition, just as they left the factories, and will be sold very cheap for cash. Address S. 30, care THE MILLING WORLD, Buffalo, N. Y. 17

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A mill in a good neighborhood, for all kinds of custom work, consisting of five burrs, upright and circular saws, with other machinery, all in good order, turned by two overshot and one turbine wheels. Terms easy. Apply to C. W. DOWNEY, Administrator, Taylortown, Loudoun county, Va. 36

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One 6-horse power engine and 10-horse power boiler, all complete, price, \$350; one 8-horse power engine and 10-horse power boiler, price, \$375; one 10-horse power portable complete, price, \$350; one 10-horse power Russell Traction, price, \$500; one 4-horse power vertical engine, price, \$120. Call or address for particulars EZRA F. LANDIS, Lancaster, Pa. 262

#### FOR SALE.

A four-run New Process water power flouring mill, and 180 acres of very choice land; 40 acres of young timber. Situated in Colfax county, Neb. Mill in good repair. A never-failing water power. All facilities for making first class flour. A good chance to do a first-class paying business. Owners desire to go into other business. This property will be sold at half its cost. Address, J. A. GRIMISON, Schuyler, Colfax county, Neb. 177f

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By a young married miller of seven year's experience in custom work. A situation as miller in some good mill. Am used to water and steam. Prefer Central New York. Address, A. L. WHEELER, Canastota, N. Y. 35

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"Cooch's Bridge, Del., Aug. 25, '84.  
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"Gentlemen: Your machine was sent here against an —, on condition that we should keep the best, and we tried each machine, and are frank to say that if your machine cost us \$500 and the other was offered us as a present we should take yours, as we cannot find a fault with it. The above machine has a capacity of 50 bushels per hour."

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Do not order your cloth until you have conferred with us. It will pay you, both in point of quality and price. We are prepared with special facilities for this work. Write us before you order.

CASE MANUFACTURING CO.,

Columbus, Ohio.

Office and Factory, 5th Street, north of Naughten.





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 (LIMITED.)

OFFICES, LEWIS BLOCK, SWAN STREET,  
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 THOS. McFAUL, - - General Agent.

#### SUBSCRIPTION.

In the United States and Canada, postage prepaid, \$1.50 Per Year, in advance; can be remitted by Postal order, registered letter, or New York Exchange. If currency is enclosed in unregistered letter, it must be at sender's risk.

To all Foreign Countries embraced in the General Postal Union, \$2.25 Per Year, in advance.

Subscribers can have the mailing address of their paper changed as often as they desire. Send both old and new addresses. Those who fail to receive their papers promptly will please notify at once.

#### ADVERTISING.

Card of Rates sent promptly on application. Orders for new advertisements should reach this office on Tuesday morning, to insure insertion in the week's issue. Changes for current advertisements should be sent so as to reach this office Saturdays.

#### EDITOR'S ANNOUNCEMENT.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

Correspondents must give their full name and address, not necessarily for publication, but as a guarantee of good faith.

This paper has no connection with any manufacturing or mill furnishing business. Its editorial opinions cannot and will not be influenced by a bestowal or refusal of patronage. It has nothing for sale, but its space to advertisers and itself to subscribers.

Entered at the Post Office, at Buffalo, N. Y., as mail matter of second-class.

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THE MILLING WORLD, per year.....\$1.50

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The Builder and Woodworker.....	(\$1.00 per year)	2.00
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#### Take these for your Children.

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READERS of THE MILLING WORLD will be pleased to know that the country is safe. We gather this information from our metropolitan exchanges, and have every confidence in its truth.

THE "Mechanical Engineer" gets off a good thing once in a while. Here is one. A writer in "The Millstone," after asserting that the flour of to-day is much inferior to that of thirty years ago, asks what is the cause. The M. E. answers:

We will tell him—it is the thirty years. Put that period on the average boy's palate, and, to the man, things in general are not so good as they were. Too much shag tobacco, too many beers, too much alleged pie—leaving whisky out—blunt the fine sensibilities of the palate, and men think the fault is in the substance. Things taste just as good to the children of this day as they did to the children of thirty years ago.

THE second American Electrical Exhibition will open in Boston on December 1, and close in the early part of January. The

late exhibition at Philadelphia did not contain anything practically relating to milling machinery, and it remains to be seen whether anything of that kind will be found at Boston.

A GOOD many people will not be enthusiastically thankful to-day, although living is cheap, crops have been bountiful, and the country is in a condition of profound, even oppressive, peace. Turkeys have roosted comparatively low in price thus far this year, and a thoughtful friend has given us a pointer as to where they can be obtained below even current quotations, but as no friend could give us definite information as to how we could procure sufficient of the "root" to influence the holder of the gobblers to transfer possession thereof to us, we are fain to dine out upon invitation.

PROTECTION seems to be all the rage in Europe. If the cable dispatches are correct then the proposed increased grain and flour duties in France have been adopted. Whether such an action will be sufficient to keep that much dreaded specter "American competition" out of the French markets, is an entirely different question, more so with our present low prices of flour and grain. The total of such exports to France amounted to about \$18,500,000 in 1883 and it remains to be seen whether the new tariffs will be able to reduce this sum so very materially as to raise the French grain culture to the desired standard.

OUR Canadian neighbors are actively engaged in preparations which will insure them against the rather lax trade between the West and the seaboard by the way of the great lakes and the St. Lawrence river. The action proposed is to deepen the Welland Canal to 16 feet, and thus allow larger vessels to pass through and eventually realize their pet scheme of shipping grain and flour directly to England from Chicago or Milwaukee without any trans-shipment whatever. As feasible as the plan appears on its face, there will be many a ton of water tumbling over Niagara Falls before it is accomplished successfully.

WHILE almost every branch of industry sighs about bad times, the millwright's business, although far from flourishing, appears to be at least in a fair condition everywhere, in Europe as well as in America. The present depressed state of trade seems to bring out the advantages of modern milling systems over the older forms more and more, necessitating changes of larger or smaller character. Moreover, labor is cheaper now than in flourishing times, likewise the material, and taken all in all, the remodeling of a mill can be done at a cheaper figure now than in prosperous business times. The knowledge of this appears to induce millers to make the necessary changes, an action which ensures a fair degree of activity to millwright establishments.

THERE is likely to be considerable agitation during the winter as to the Government establishing a postal telegraph, either by the construction of new lines of wire, or by the purchase of existing lines. It seems to be pretty generally admitted that the telegraphic system of the country, as at present controlled and managed, may be employed to the serious detriment of the business interests of the United States, hence the demand that the Government assume control is in some quarters daily becoming more emphatic. Perhaps it might be as well to wait a little before too much attention is given this matter. Telegraph, like other stocks, are not paying princely dividends just now, while competition between rival lines is daily becoming stronger, putting farther and farther

off the day of magnificent returns. Let us hold on awhile and some of the watered stock will evaporate.

THE incoming United States Congress will have to decide at an early date on three canal projects, which, as they affect the cheap transportation question, may be of interest to some of our readers. First of all there is the much discussed Hennepin canal scheme, that much abused project which still refuses to be killed; then there is a bill about the Maryland and Delaware canal, and last, but not least, one which proposes to have the United States share the expenses necessary for the free maintenance of the Erie canal, with the State of New York, which asks for a subsidy of \$1,000,000 annually for the next ten years. In view of the large sums expended annually for river and harbor improvements, and the general utility of the Erie canal, \$1,000,000 should not form a very serious item in the overflowing treasury of the United States, and yet, competent authorities consider it very doubtful whether any one of these canals bill will be noticed by Congress during the coming session.

SPEAKING about dust explosions, a case from Germany is worthy of notice. A sack of flour falling down stairs, opened and scattered the contents in a cloud through the lower room, where a burning gas flame set fire to the dust, causing an explosion which lifted a part of the roof off the mill and broke almost all of the windows. There can be no doubt that the majority of dust explosions are like mine disasters, due to open lights, and as this danger can be practically avoided by the use of the incandescent electric lights, there really seems to be no valid reason why it should not be introduced more generally, as those establishments which have used it express themselves in its favor. No matter how carefully other lights are guarded, an absolute safety, as long as the globes are intact, is offered only by the incandescent lamps, where the atmosphere or the dust has no access whatever to the flame. The above instance teaches also how little is necessary to start an explosion in the cleanest mill, as long as opened lights are used; how much greater must the danger be in establishments where the air is constantly charged with dust, and where cleanliness is looked upon as of minor importance. Of course electric sparks generated by the friction of the belts may set fire to the dust, but the danger from this source is unquestionably small as compared with that from open lights. The fact that dust explosions are of rare occurrence, should not deter the miller from giving the closest attention to the subject, and by constant care insure an increased safety to his mill.

THE navigation season on the lakes is practically closed in some of the ports, and will be closed entirely before long everywhere. From every city we hear that it has been the most unprofitable to vessel owners ever known, and that the majority have been unable to do more than pay expenses, while large numbers are actual losers. News along the state canals echo the same cry, and claim that the past summer has been the most disastrous to boatmen in twenty years, although the canals, which are to close officially on Dec. 1, will have had 209 days of navigation against 208 days during 1883. Although the summer boats have been tied up along the different canals, unable to obtain freight at paying rates, this should not create any surprise in view of the universal stagnation of commerce everywhere. But the question occurs is it just for vessel owners to send out such bitter complaints? If they have been able to pay expenses with the low rates of freight of between 2 and 3 cents per bushel, during the

past season, how very large must their profits have been in former years when freights were 7, 8, or even more cents per bushel. It seems that the past few years have been necessary to dispel the idea of constant heavy dividends, and to adjust things to an economical basis. If that has been attained the past experience has not been purchased at too high price, and vessel and boat owners will know at the reopening of navigation next year whether it will pay them to place their crafts in service or not. We fail to see the reason why lake and canal navigation should pay higher dividends during a time of commercial depression than any other branch of commerce and industry. Expenses were cut down everywhere, the strictest economy has been exercised and if vessel owners have been slower to learn the lesson of the times than others, it is their own fault, and they cannot blame any one but themselves.

THE committee of the Bohemian millers convention describes the decline of the Bohemian milling industry, and mentions as its principal cause, the competition of the Budapest mills, which drive the home products out of the market. In addition to this, the home industry is injured by the free importation of bread from Saxony and Silesia, which causes the ruin of many bakers living on the Austrian boundary line. The committee is of the opinion that a protective tariff against Hungary is more necessary than one against Germany, and considers the millers justified in demanding such a tariff. The resolutions acted upon by the convention included the following: To prevent the peddler trade with German bread, and, in case that the commercial treaty with Italy should be renewed to place a tariff of 1½ fl. on every 100 kilos. of bread. To place the grain tariffs at a figure that will make them 25 per cent. less than the flour tariffs, and to withdraw certain privileges granted in Bohemia to the Hungarian millers, such as free or reduced storage and free storage room, etc. So far the millers circular. What action the convention has taken in the matter we have not yet learned, but it is exceedingly difficult to imagine that any action, whatsoever, would be of any use. Hungary and Austria are practically one state, and we have here the curious spectacle of seeing a part of a state asking for protection against another part of the same state. How ridiculous it would seem, even to the most orthodox protectionist, to have one or the other State of the Union ask for a protective tariff against Minnesota flour; and yet such action would be no more ridiculous than the action of the Bohemian millers. If these millers had the framing of the laws, there is no doubt, that we soon would witness a queer revolution in the industry and commerce of the country, but fortunately for mankind at large, any one separate industry can do no more than frame a certain number of resolutions and must then run the risk of overcoming opposition from other quarters whose interest are directly injured by the passage of such laws as the resolutions demand. Between such many-sided discussions the public mind is educated to an understanding of the questions at issue, especially where the price of bread is concerned, and the most unanimous action of the Bohemian millers will not be able to prevent their resolutions from dying a natural death at the hands of their government. News has been telegraphed from Paris, dated Nov. 17, that the Municipal Council of that city has temporarily renewed the tax on bread. This is undoubtedly the answer to the action of the Paris bakers who declared their intention not to reduce the price of bread at the invitation of the government, but retain their prices in spite of the low cost of flour.



ESTABLISHED 1856.

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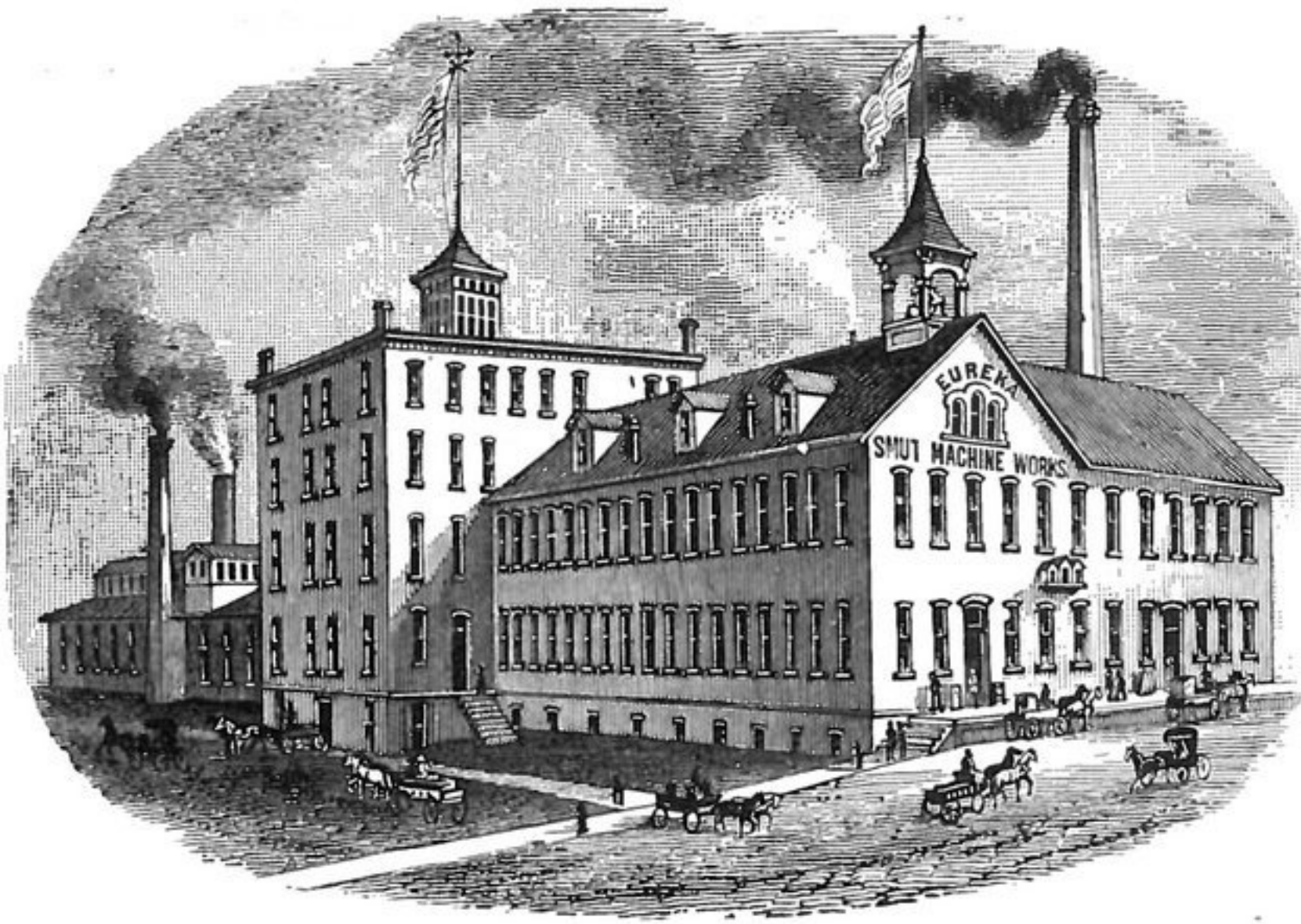
OUR LINE COMPRISES

The Eureka Separator,  
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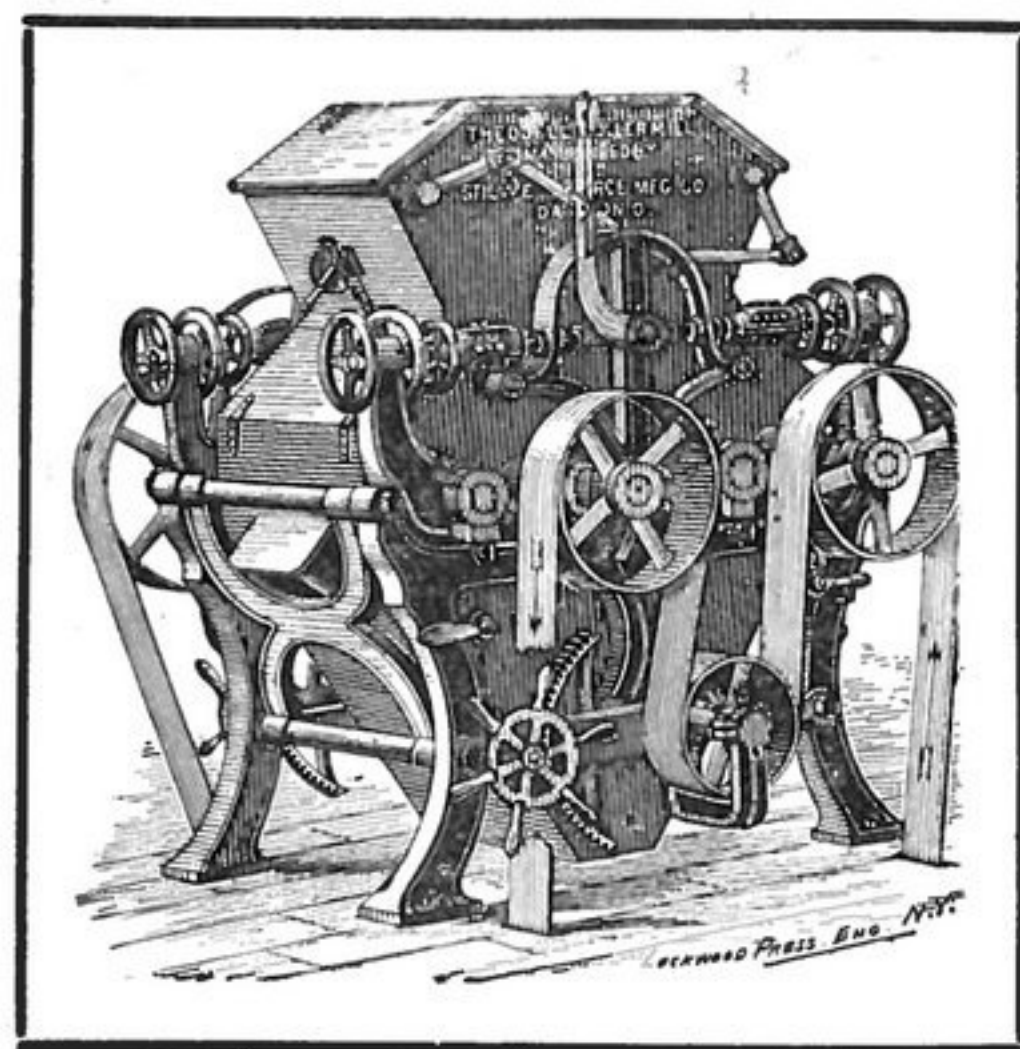
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Guaranteeing it to be equal in every particular to any other cloth on the market, except the Dufour. We have handled it for years, have sold thousands of yards of it, and know it will fully sustain our representations.

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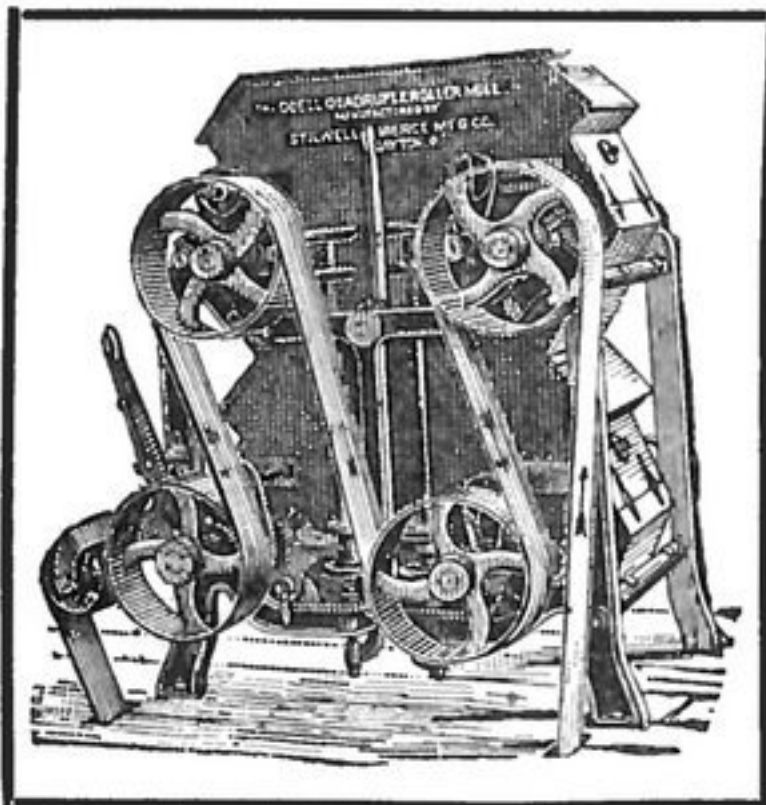
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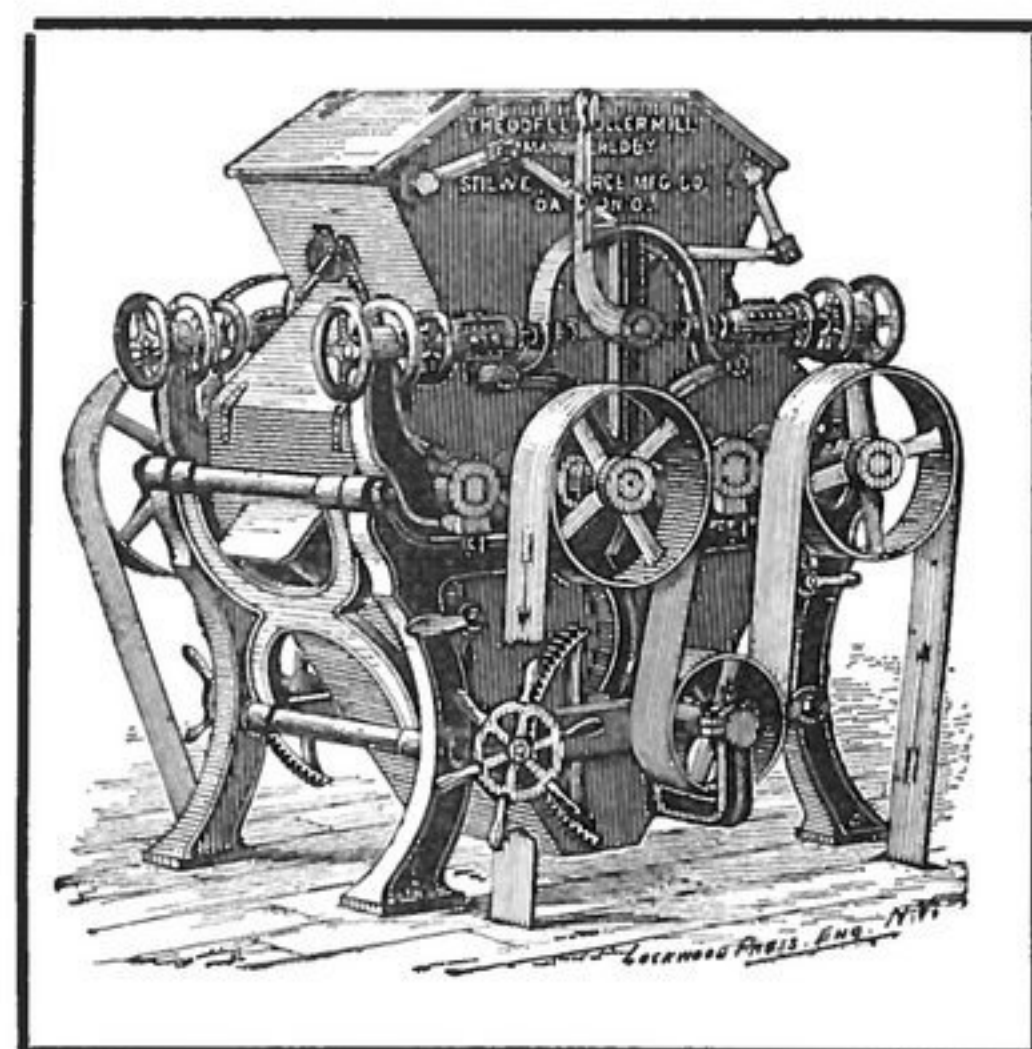
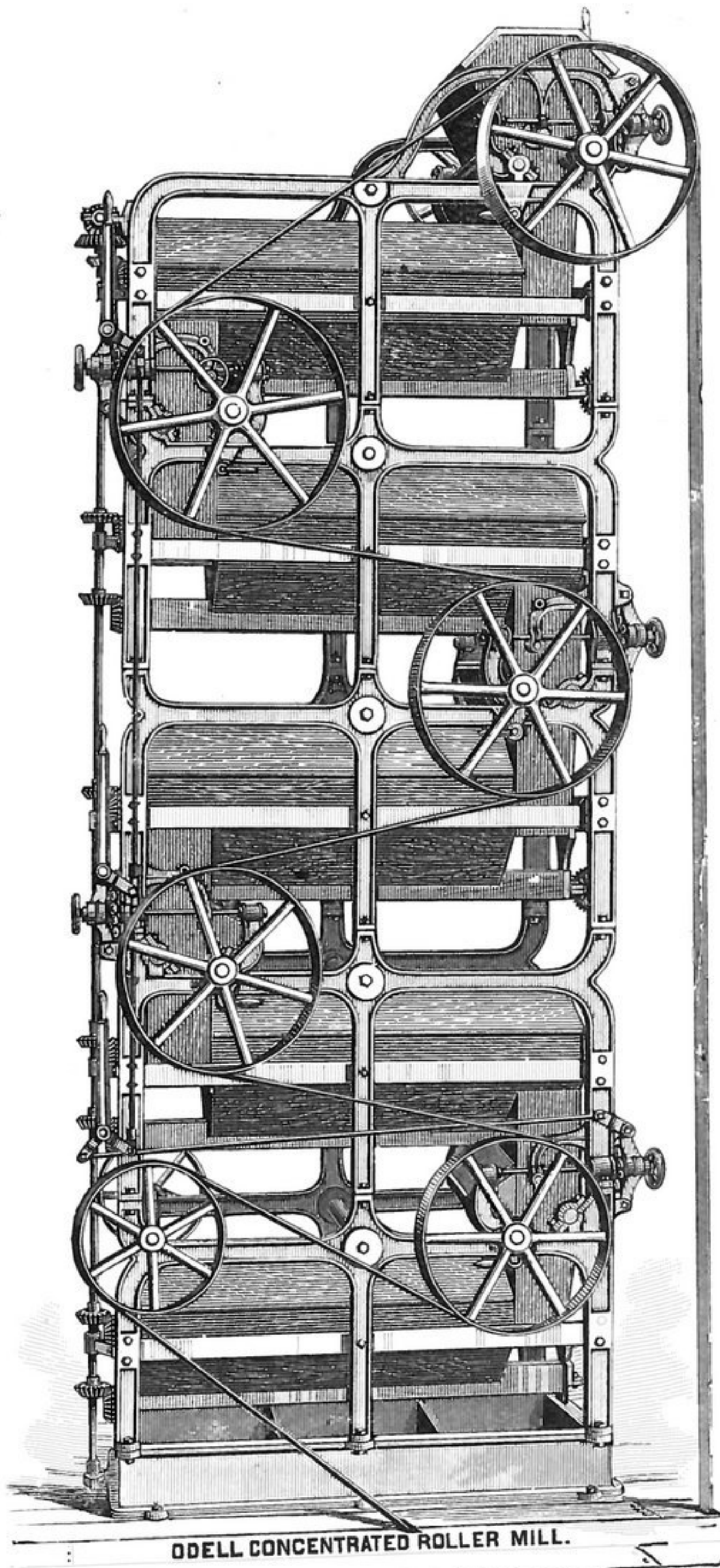
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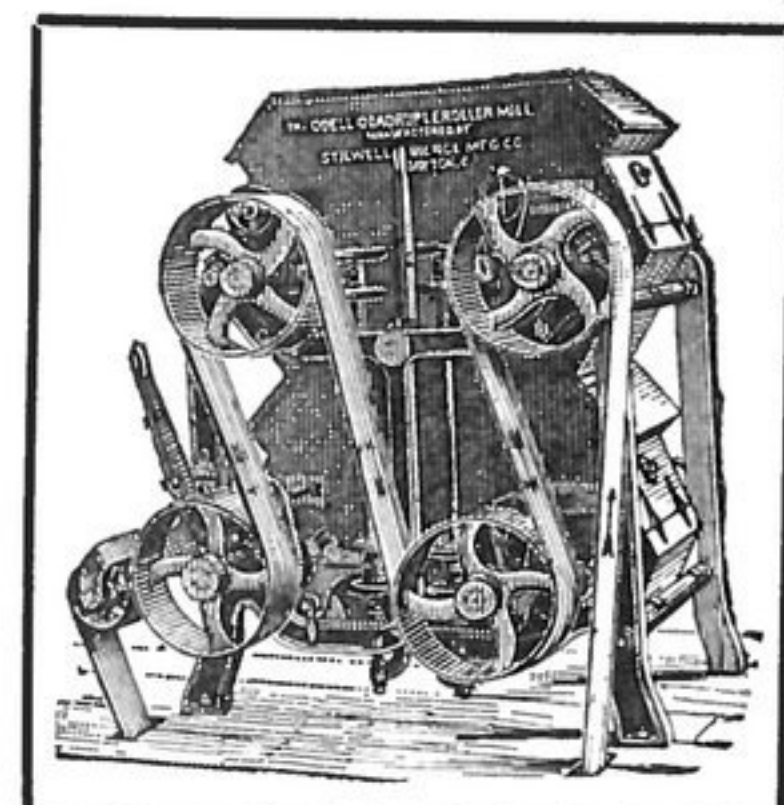
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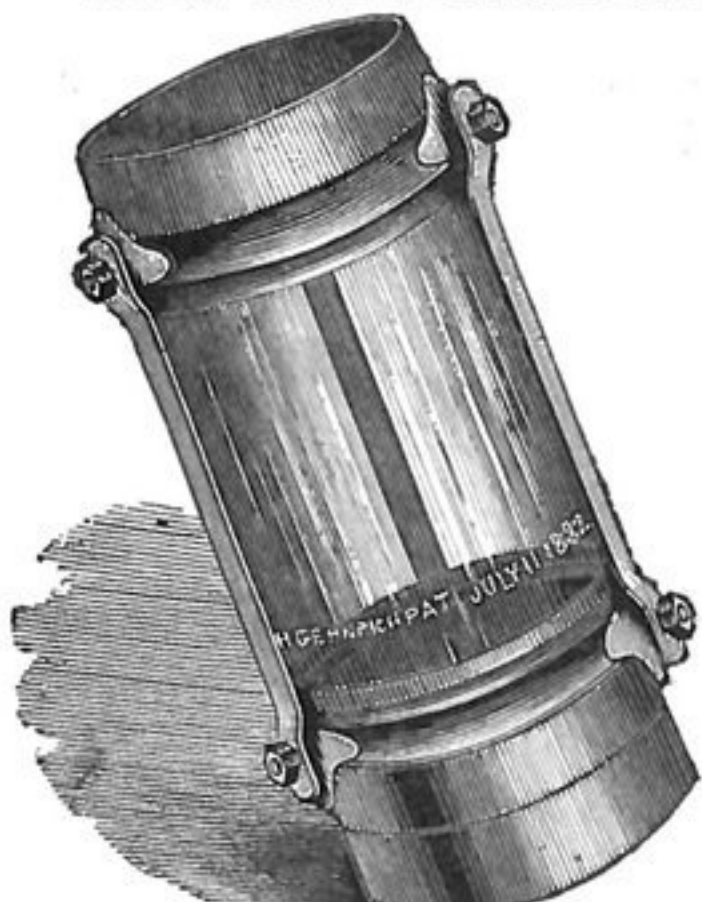
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FOR  
PRICES.  
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## GEHRICH'S PATENT GLASS TUBE JOINTS

AN IMPORTANT INVENTION FOR MILLERS.



This invention consists of a Glass Tube Joint, which can be made to correspond in size to and be inserted in any tin spout used to convey grain, meal, etc., in the operation of Grinding Flour and other substances. A section of the spout is thereby *Rendered Transparent*, enabling the miller, or any one passing by, to see at a glance whether the contents of the spouts are properly running. By the use of this appliance the necessity of frequently opening spouts is avoided, and the consequent saving of time and flour is very important in an economical point of view. These Glass Tube Joints have given the most complete satisfaction, and are esteemed as an indispensable requisite wherever they have been applied. Full information furnished on application to the inventor.

**H. GEHRICH, 54 Rutgers St. NEW YORK CITY.**

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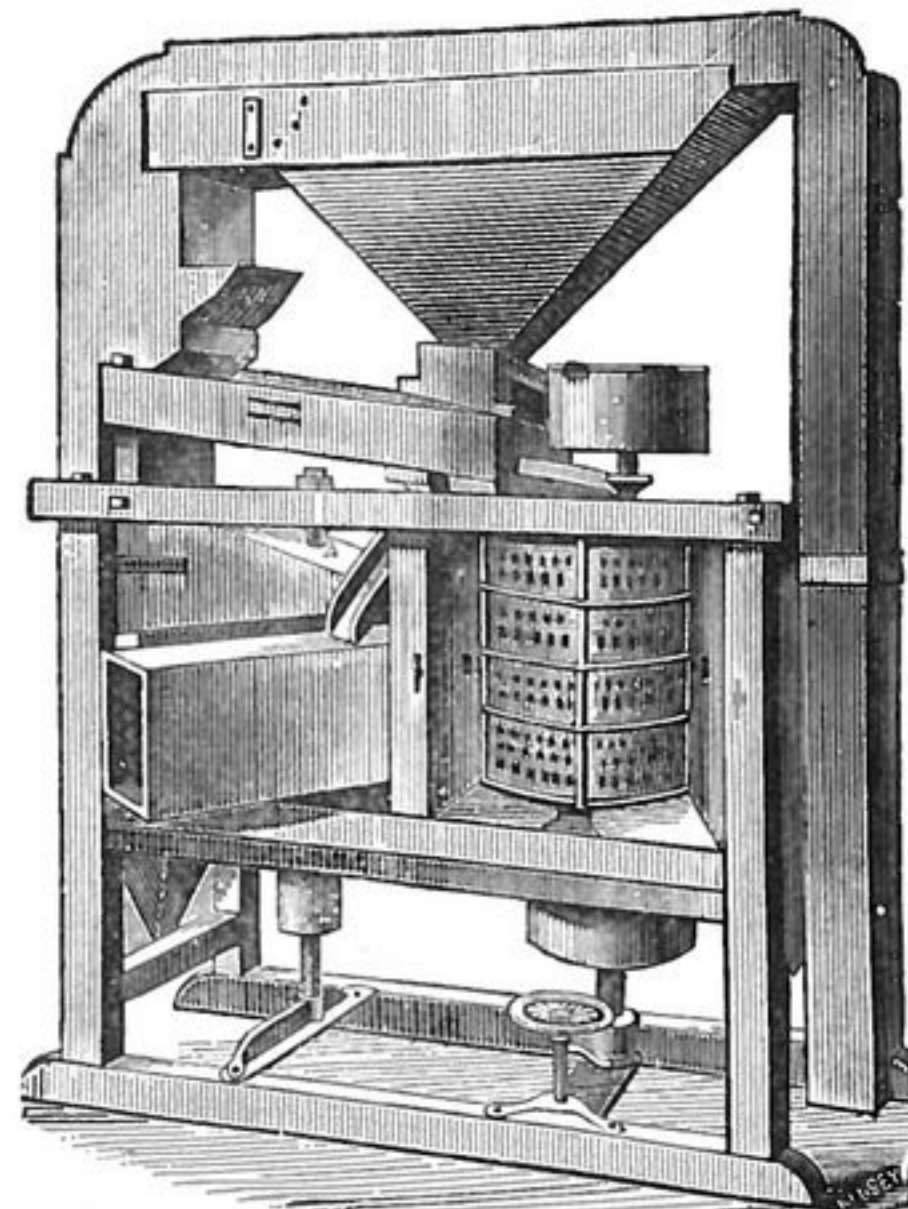
Improved Adjustable  
**GRAIN RUBBING, POLISHING**  
—AND—  
**SEPARATING MACHINE**  
COMBINED.

It will clean, rub and separate wheat, and take out the rat balls, black seed seeds, joints of straws, cockle and other impurities. It will also rub off more fuzzy ends and dust from the creases of the berries, by rubbing the wheat together as it passes up between the rubbers, so each berry must get rubbed, scoured, and polished alike. It will do all of this work better and last longer than any other machine of the kind. All this we guarantee. It will also clean barley and rye.

SEND FOR DESCRIPTION & PRICE LIST.

**Kreider, Campbell & Co.**

MILLWRIGHTS & MACHINISTS,  
1030 Germantown Avenue, Philadelphia, Penn.





## LIENS FOR MACHINERY FURNISHERS.

BY MYRON T. BLY.

IT frequently becomes an important question to mill furnishers and manufacturers and furnishers of machinery of various kinds, how they are to be secured when machinery is put into mills and building on credit, or not to be paid for until used. In many cases the machinery partakes of the nature of fixtures. It then becomes a part of the realty and ceases to be chattels. If the real estate is mortgaged, the machinery may be covered by the mortgage, and the furnisher loses all right to take possession of the machinery he has put in, and by the foreclosure of the mortgage and financial failure of the owner of the property, he is without remedy. We have known of cases in which vendors have taken chattel mortgages on machinery and appliances put into mills and buildings, to secure part payment of the purchase price. Frequently, also, the sale of machinery is a conditional contract. It is agreed between the vendor and vendee that the title shall not pass until it is paid for, and the law will uphold a sale of chattels made on such condition, although in some states, as in New York, the agreement must be in writing, and filed as a chattel mortgage. In the absence of a statute making a writing obligatory, a conditional sale is valid, whether made orally or expressed in writing. As just intimated, however, the difficulty which the furnisher may get into if he relies on a chattel mortgage or conditional sale to protect himself, is the fact that when the machinery is put into place and set up, it may, and usually does, become a fixture and a part of the realty, and the furnisher's security is good for nothing, and the conditional sale loses its force.

As to whether a piece of machinery will become a fixture when put into a building or manufactory of any kind, depends largely upon the circumstances of a particular case. As a general rule, it will become a fixture, if so attached and affixed to the mill or building as to become a permanent and an habitual part of it, or, if it becomes a component part of the structure for the purposes for which it is designed, or if without it the mill or manufactory would be incomplete or imperfect, it is a fixture. Something depends, also, upon the intent of the purchaser in putting it in. If it is put in with the intent of making it a permanent accession to the building, and of using and adopting it as a part of the machinery and process of manufacturing, such intent will do much toward making it a fixture in the eye of the law, without reference to the manner in which it is attached and affixed to the building, and without reference to the fact whether it can be removed without damage or injury to the structure. In brief, if the article or appliance is essential to the use of the mill or to carrying on the process of manufacture for which the building is designed, and has been put in to be used exclusively in connection with it, and is a necessary part of the machinery, or a necessary appliance for carrying on the particular manufacture, and without it, the efficiency of the mill would be appreciably impaired, then it is a fixture, and a part and parcel of the building, and of land upon which it stands. For amplification of the law of fixtures, with illustrations taken from cases which have actually occurred, the reader is referred to an article on the subject by the present writer in THE MILLING WORLD of April 3, 1884.

On applying the above rules, therefore, if there is any doubt that the machinery or appliance may become a fixture, and the furnisher proposes to have a lien to secure himself for the purchase price, or a part of it, by agreement with the purchaser, the only safe and secure lien is a real estate mortgage, covering the structure in which the machinery is placed. But there are very

frequently, cases in which the furnisher has a lien for the whole value of machinery furnished, without any agreement with the purchaser for such lien, and the remainder of this article will be devoted to this class of liens. We refer to what is commonly known as the mechanic's lien. A better designation would be "statutory lien," as it arises and is created by express statute, and is thus distinguished from all other liens. Every state in the union has a statute creating a lien of this nature. The original design of these statutes has ordinarily been to protect workmen, mechanics and material men, who have performed work, labor or services, or furnished material toward the erection, alteration or repair of any building or structure. Every statute contains words which extend its scope as far as this, at least, although they differ somewhat in their wording. The wording of some statutes is such that its scope is extended expressly or by implication to furnishers of machinery and fixtures, while the scope of other statutes is left in doubt, and must be interpreted by the courts. In some states, as in New York, Pennsylvania, Michigan and Ohio, the wording of the statute is such that a lien is expressly created in favor of one who furnishes machinery or fixtures for a mill or manufactory of any kind. In most of the states, however, it is left in doubt, but it may be stated as a general rule of law, that machinery incorporated into a building, in such a manner as to become fixtures, will subject the entire building and the land on which it stands, to a lien, for the value of the fixtures.

It may also be stated as a general rule of law that the lien attaches from the time the machinery is put in position or affixed to the building, and it takes precedence of all other liens or incumbrances placed upon the property after that time. In other words, the owner of the structure cannot, by agreement with someone else, or by suffering judgment, create a lien on the property which will be prior to that arising in favor of him who furnishes fixtures. As a matter of course, the statutes being designed to create liens on real property, no lien will arise in favor of him who furnishes machinery which is so placed in a building, and used and applied that it does not become a fixture, but remains personal property.

As we have intimated above, most of the statutes of the various states create a lien for "materials furnished and services rendered in the construction, erection or repair of any building." Connecticut had a statute worded in that way, and its courts held that it created no lien for machinery furnished for fitting up a woolen mill, although the machinery was so affixed and attached to the building as to become fixtures, and a part and parcel of the structure, for the reason that the furnishing of the machinery does not constitute an erection, alteration or repair. In this case the building was already erected at the time the contract for furnishing the machinery was made. Had the machinery been furnished and put in at the time of the erection of the building, then the furnisher would have had a lien and the court so held, because it would constitute an "erection" coming within the meaning of the act.

It may be stated as a further general rule of law, therefore, that a person contracting to erect a building and equip it with machinery and fixtures for manufacturing purposes, will have a lien, not only for the materials that are used in the construction of the building, but also for the machinery and fixtures. Unfortunately, however, in actual practice, this course is so seldom carried out by furnishers of machinery, that they would receive very little benefit from the mechanic's lien laws, if they were brought within the scope of the laws in no other case. If the statute contains words giving a

lien for "improvements" to a building or structure, it has been held that the putting in of machinery in the nature of fixture, is an improvement and gives rise to a lien.

Readers may be inclined to think that there is a good deal of quibbling about the mechanics lien laws as construed by the courts. It arises in this way. The statutes are in derogation of the common law. They create a lien which would not exist if the statute were not enacted and impose a lien upon a man's real property without his express consent for a lien, and therefore they must be strictly construed; that is the courts must not allow a lien to be created by them, in cases where it was not the intention of the legislature to create a lien. The interpretation of the intention of a legislature as manifested in a statute, is a work in which any judge not more than human, might err.

In conclusion, we would advise machinery furnishers as well as purchasers, if they wish to ascertain when a lien will arise for machinery and fixtures furnished, to consult the statute of their own state and the decisions of the courts construing it.

## ENCOURAGING TO NORTHWESTERN WHEAT GROWERS.

The extraordinary depression of the wheat market results, of course, chiefly from excessive production — unusually abundant crops having been yielded upon largely increased areas in nearly all the wheat-growing states; while the foreign demand has been reduced by the concurrence of similar conditions in the old world. The effect of this over-supply has been to reduce the price of wheat over wide districts of the United States, as well as in England, below the actual cost of production. The "Pioneer Press" not long ago pointed out that the inevitable economic consequences of this state of things would be an immense decrease in the areas of wheat production in this country and throughout the world. In England, where the crop was above the average, the farmers are unable to realize the cost of production at existing prices, and wheat raising has been subjected to so many ruinous vicissitudes of yield and price for many years that there is a general disposition to abandon it. What is true of England is true of the greater portions of the wheat regions of the United States. Information from reliable sources shows that in the winter wheat states especially, where three-fourths of the total wheat crop of the United States is raised, there is going to be an immense decrease in the acreage, and that the disgusted and disheartened farmers are going to put their land in what they regard as the more profitable crops of corn and other grains. The discouraging effect of the ruinously low prices of wheat will extend over nearly the entire area of its most unprofitable production in an enormous reduction of the acreage put in wheat this winter and next spring; and this again is likely to result in a limited and perhaps deficient supply, with higher prices than have been realized for years before.

The "Pioneer Press" has already called attention to the fact that this state of things

is likely to rebound greatly to the advantage of the wheat growers of Minnesota and Dakota. For low as is the price of wheat in this region, it is considerably higher, relatively, than in Kansas and other Western states. This is partly due, of course, to the superior quality of the hard spring wheat of Minnesota and Dakota, and partly to the competition for this hard wheat supply between the Minneapolis mills and the short haul to Duluth. For these reasons higher relative prices prevail over this northern wheat belt than anywhere else in the United States—and the results, though temporarily embarrassing, are not so discouraging or so ruinous to the wheat grower as in other sections of the country. So far from there being anything discouraging to the wheat farmers of Minnesota in the existing state of the wheat market, it is full of brilliant promise for next year, especially. With the almost certain prospect of an immense decrease of the acreage in all the winter wheat states, and consequently of a limited supply and correspondingly higher prices next year, the farmers of this Northwestern wheat belt will act wisely if, instead of putting less land in wheat next spring, they put more. All the signs of the times make it probable that with the oscillation from a superabundant supply this year to a largely decreased and perhaps inadequate supply next year, prices will swing back to a higher point than has been reached for years before.

In any event, it is quite certain that the decrease in acreage elsewhere will be sufficient to cause a very considerable advance in the price of wheat, and that it will be the most profitable crop, upon an average yield, which the farmers of Minnesota and Dakota can raise next year. This is the conclusion which ordinary business sagacity will draw from existing conditions. We have heretofore been advising the farmers of the Northwest not to risk everything upon a single crop so uncertain and fluctuating in its yield and price as wheat. We do not withdraw that advice. But while the uncertainty of the yield still remains to admonish the farmer to guard against the danger of relying upon one precarious crop, it is safe to predict that all the wheat of fair quality that can be raised in Minnesota and Dakota in 1885 will command a fair price, and probably a very remunerative price.

THE bureau of the United States geological survey has decided to undertake a systematic and scientific observation of earthquakes and designated Capt. Dutton to prepare the necessary plans. Dutton speaks confidently of the practicability of recording by delicately constructed instruments all phenomena connected therewith.

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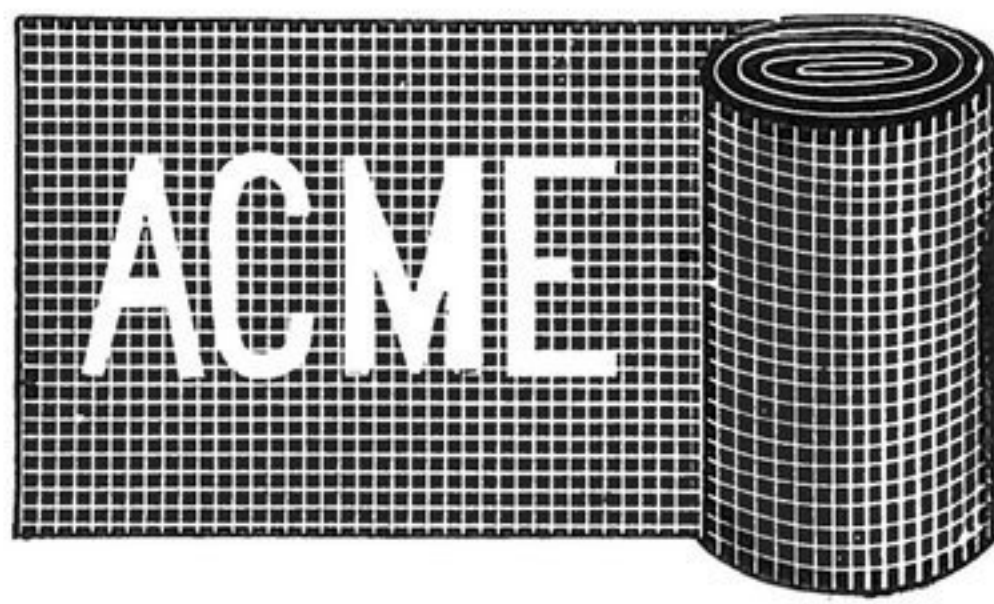
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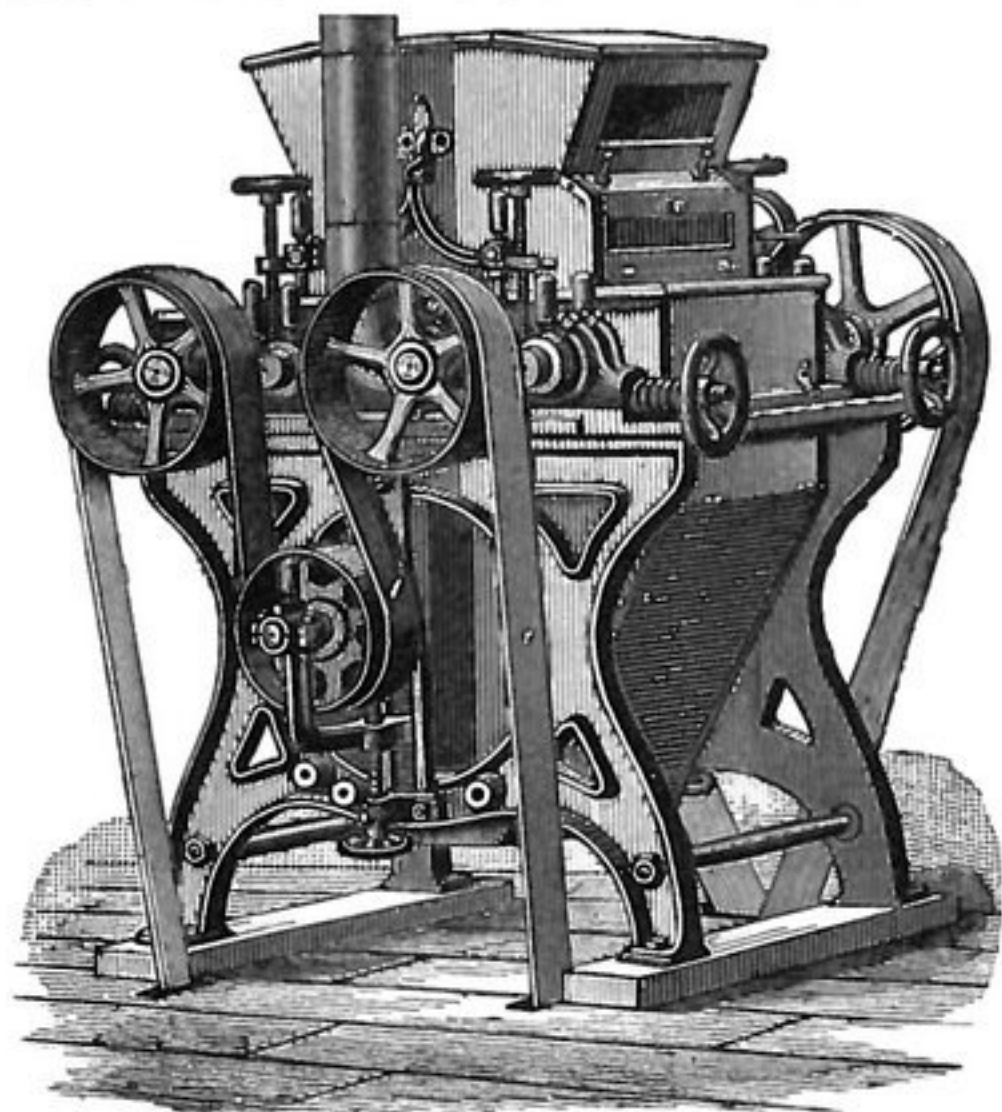
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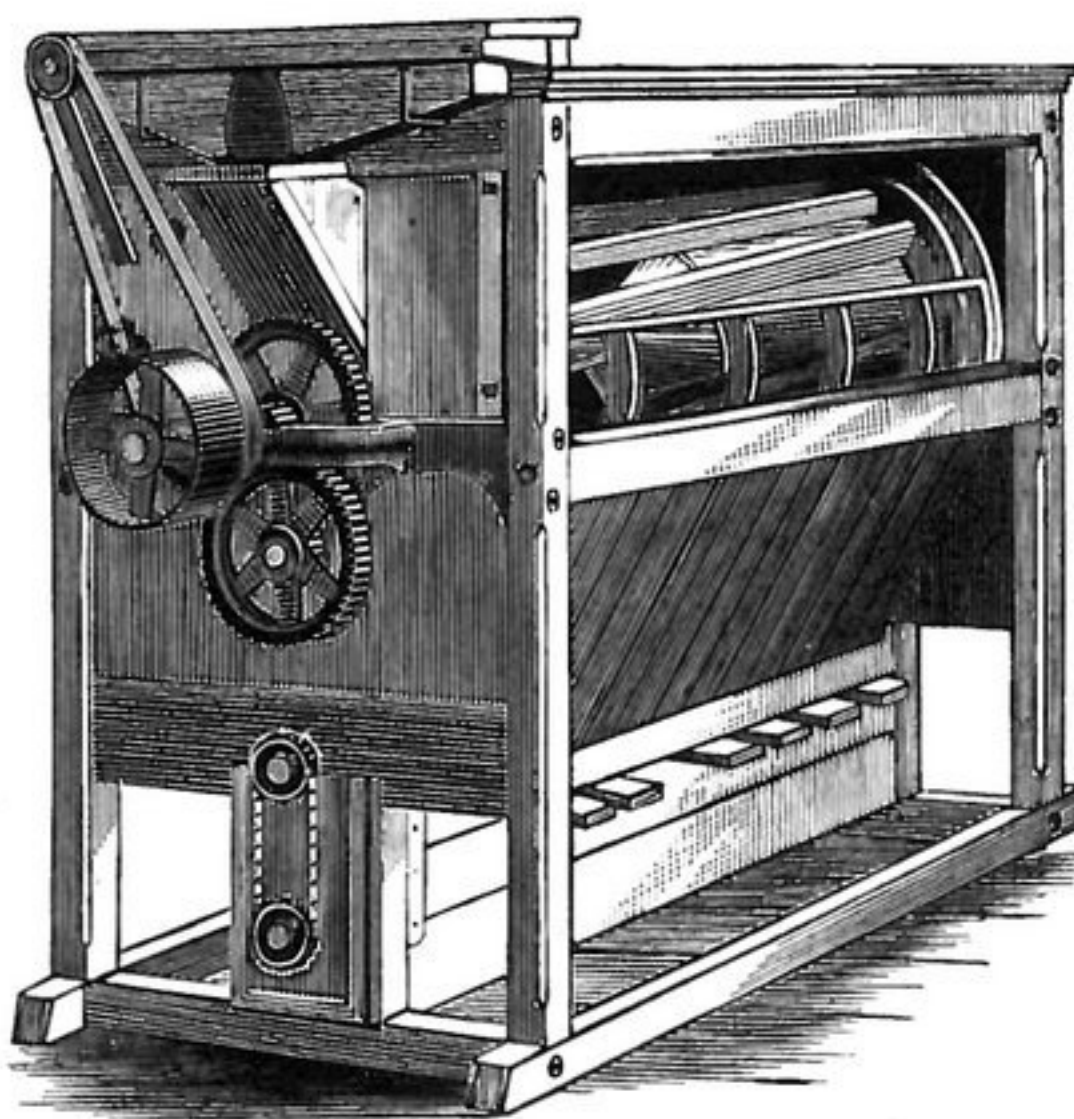
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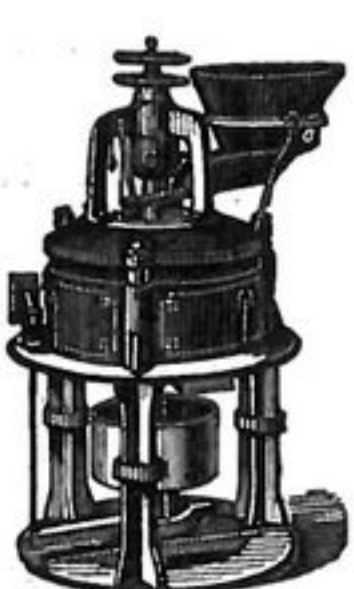
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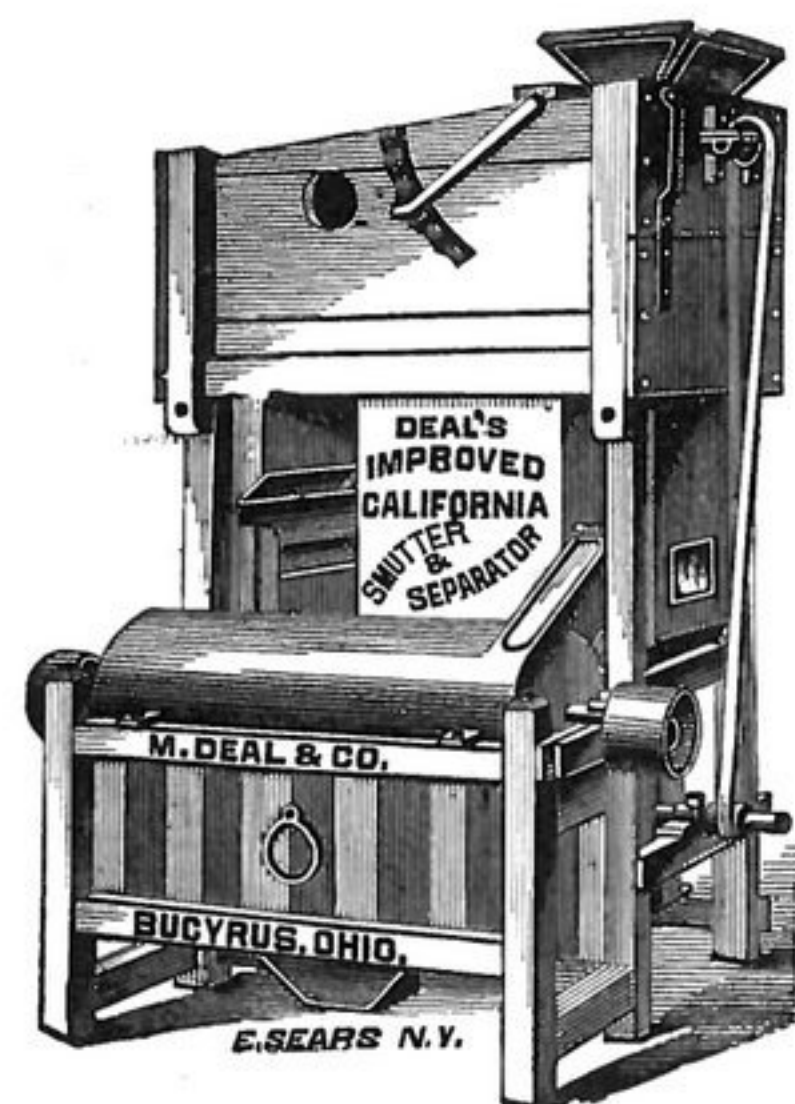
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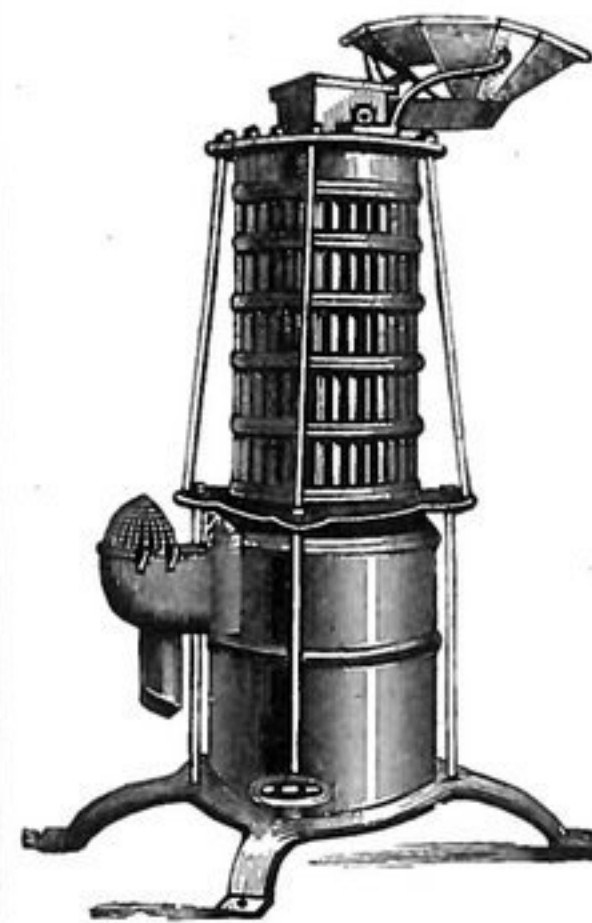
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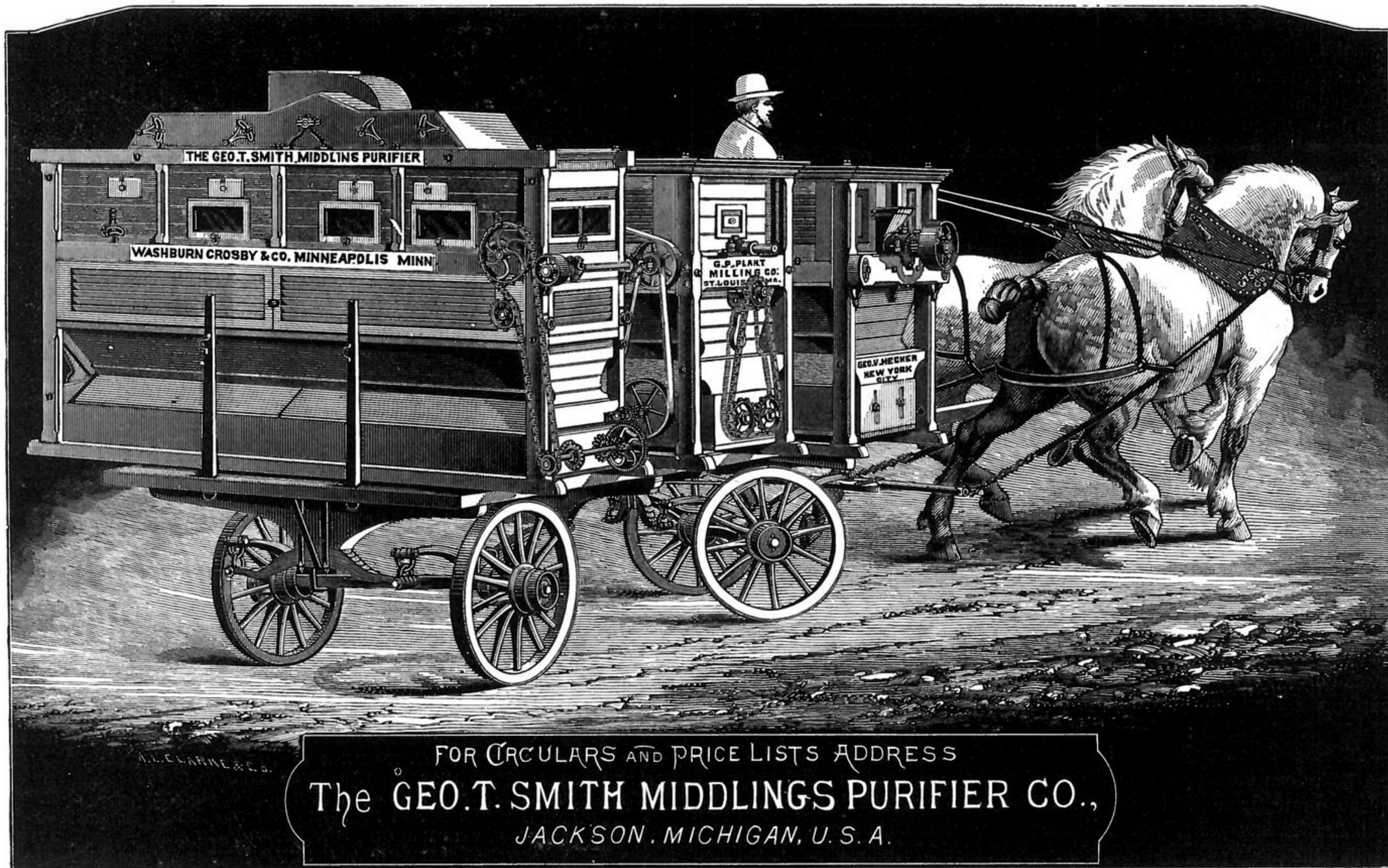
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### BOILER EXPLOSIONS IN GER- MANY DURING 1883.

THE number of boiler explosions throughout the German Empire, says Die Muehle, has not increased during 1883, although the application of steam power has magnified considerably; if we take an average between the years 1877 and 1883, the number of explosions has decreased. The average has been 16 annually; 1883 had only 14, according to the official statistics.

The average annual number of people killed or injured in these explosions has been 49 between 1877 and 1883; in 1883 the number increased to 55; 23 of these were killed instantly or died within 48 hours after the accident; 8 were wounded dangerously and 24 slightly. Within the past seven years we have the record of 115 boiler explosions, killing 127 persons, dangerously injuring 74, and slightly 146 people. The presumable causes of these 115 explosions were: insufficient water in the boiler, 32; local weakness in the boiler plates, 32; worn out boilers, 7; bad construction, 22; too high a steam pressure, 12; poor attendance, 6 cases; incrustated boiler, 3; and one due to unknown causes. Only one milling establishment in Germany has to record a boiler explosion during 1883, due to incompetent attendance, corrosion of boiler and too high a steam pressure. The boiler was one not in ordinary use, but fired only when special work was required in the mill, and in consequence of this, less care had been bestowed upon its preservation. The mill was situated in Freienwalde, Prussia, and owned by Mr. Emil Strutz.

### SAFETY VALVES.

The ignorance oftentimes displayed in the management of safety valves renders it desirable to give some necessary data with regard to them, such as hints on their management, how to calculate the position of the weight to give any required pressure, and also something about the proper pressures to which boilers may be subjected under different circumstances, says the "Locomotive."

The carelessness sometimes displayed by engineers (?) who have charge of boilers, is simply criminal, and deserves the severest penalties. A recent occurrence will illustrate this. Visiting an establishment where we had boilers insured, our attention was attracted by the suspicious actions of the engineer. Watching for what he supposed was a favorable opportunity, he climbed up on top of the boilers and headed toward the safety-valve, always keeping as nearly between it and us as he could, but not, however, succeeding in always keeping it from view. Reaching the valve he busied himself a few moments about it, and then returned with a nonchalant air to where we were. The following conversation then occurred:

Inspector—"Tired of living, are you?"

Engineer—"No; what do you mean?"

Inspector—"I thought perhaps you were."

Engineer—"What makes you think so?"

Inspector—"Why, from the use you make of that wedge you now have in your overalls pocket. I see that you had the safety-valve fastened down with it. Now if you want to die, why don't you go out and jump into the river, and drown yourself; then nobody's life but your own would be endangered?"

Engineer—"These boilers are all right. I don't believe a boiler can blow up so long as there is plenty of water in it. I have been running boilers twenty years." And so on to the end of the chapter.

This fellow had actually made an iron wedge, driven it into the forked guide above the lever, so that it was impossible for the valve to lift, in order to "bottle up the steam," as he expressed it. And this in spite of the fact that the pressure was all that could be safely allowed, and he had also moved the weight out on the lever fifteen pounds beyond the limit allowed. This is an actual occurrence. Now it stands to reason that if we have a boiler of a given diameter and thickness of plate, if we wish to run it for a reasonable number of years, we must limit it to a safe pressure. And by safe pressure we mean a pressure under which it will do its daily duty for a term of fifteen to twenty years without showing signs of distress. Now what is this limit? Experience, that master by which all things practiced are ultimately settled, teaches us that from one-fourth to one-fifth of the bursting pressure is the greatest under which a boiler should be habitually worked.

In the above case the boiler was 48 inches in diameter, plates  $\frac{1}{4}$  inch thick, single-riveted seams, and had been at work for about sixteen years. The greatest pressure at which such a boiler should ever be worked is seventy-five pounds per square inch. If, with fair usage, we wished to get fifteen years' services from it with safety, it would be better to limit it to sixty pounds per square inch from the beginning. There would then probably be no necessity for cutting down the pressure after the lapse of a few years.

The employment of cast iron columns as main supports has been greatly restricted at Berlin by a regulation issued recently from the architect's department of the police authorities of that city, causing great consternation amongst builders. The cause of the new order is said to have been a discovery in connection with a fire last winter in the Alte-Jacobstrasse, when it was found that the cast iron columns had been cracked by the effect of the cold water jet playing upon them so that the upper stories of the house were as near collapsing as they could possibly be. The Berlin police authorities insist upon it that where partition walls rest upon columns the latter are either to be bricked in or covered with a patent plastering in such a manner that an air space remains between the iron and the brick or plastering. In many cases a brick pier or granite pillars are prescribed.

Senator Platt, in his vigorous speech in Congress last winter in support of our patent laws, claimed that two-thirds of the aggregate wealth of the United States is due to patented inventions. That two-thirds of the \$43,000,000,000 which represents the aggregate wealth of the United States rests solely upon the inventions, past and present, of this country. Mulhall, in his "Progress of the World," writes that in effect the invention of machinery has given mankind an accession of power beyond calculation. The United States, for example, make a million sewing machines yearly, which can do as much work as formerly required 12,000,000 women working by hand. A single shoe factory in Massachusetts turns out as many pairs of boots as 30,000 bootmakers in Paris.

In estimating the power of rain, Prof. Tait calculates that the amount of force requisite to convert one pound of water from the sea or from moist earth into vapor is equal to the force exerted during one half hour by a horse. This is given out again in the form of heat as it condenses, and the pound of water falling as rain would cover a square foot of ground to the depth of rather less than one-fifth of an inch. Thus, one-fifth of an inch of rain represents a horse power for half an hour on every square foot; or, on a square mile, about a million

horse power for fourteen hours. A million horses would barely have standing room on a square mile.

The discussion of technical education in the interest of a better class of mechanics has opened up a wide field, and now it is proposed to start practical schools in which young mechanics can learn to become mechanical, civil and mining engineers, and go through the work of foundries and machine shops. A German Commission, appointed to go over the whole question, reports strongly in favor of technical schools, but urges that the hours of study be reduced to eight per week in the primary schools, and to from twenty-six to thirty-two per week in the higher schools.

It is a common mistake to assume that Australia is a country destitute of large rivers; on the contrary, it possesses one of the longest in the world, viz., the Darling, which is navigated for 2,345 miles, placing it third in rank among the rivers of the world, estimated by their navigable length, and considerably above the Nile, navigable for 1,000 miles; the Rhine, navigable for 1,500 miles; Danube, navigable for 600 miles, and the Thames, navigable for 188 miles.

Mildew can be extirpated by a simple emulsion of 1 part of phenic acid in 100 parts of water, in which soap is dissolved. The spray should fall above the leaves. The operation should take place in the evening to avoid rapid evaporation. Some hours after spraying one will find the mortification

of the tissues under the mildew spots and the drying up of the filaments.

It is well known to electricians that the best steel makes the best permanent magnet. But magnetism of steel depends upon how hot or cold the metal is. For example, steel loses its magnetism if subjected to a temperature of 100° below zero; it also loses its magnetism when heated to yellow heat—that is between red and white heats.

The report of the State geologist of Indiana, just issued, shows that there are 206 coal mines in nineteen different counties of that State, employing 5400 men receiving \$1,500,000 wages, producing 5,200,000 tons of coal, and requiring a capital of nearly \$2,000,000 for their operation.

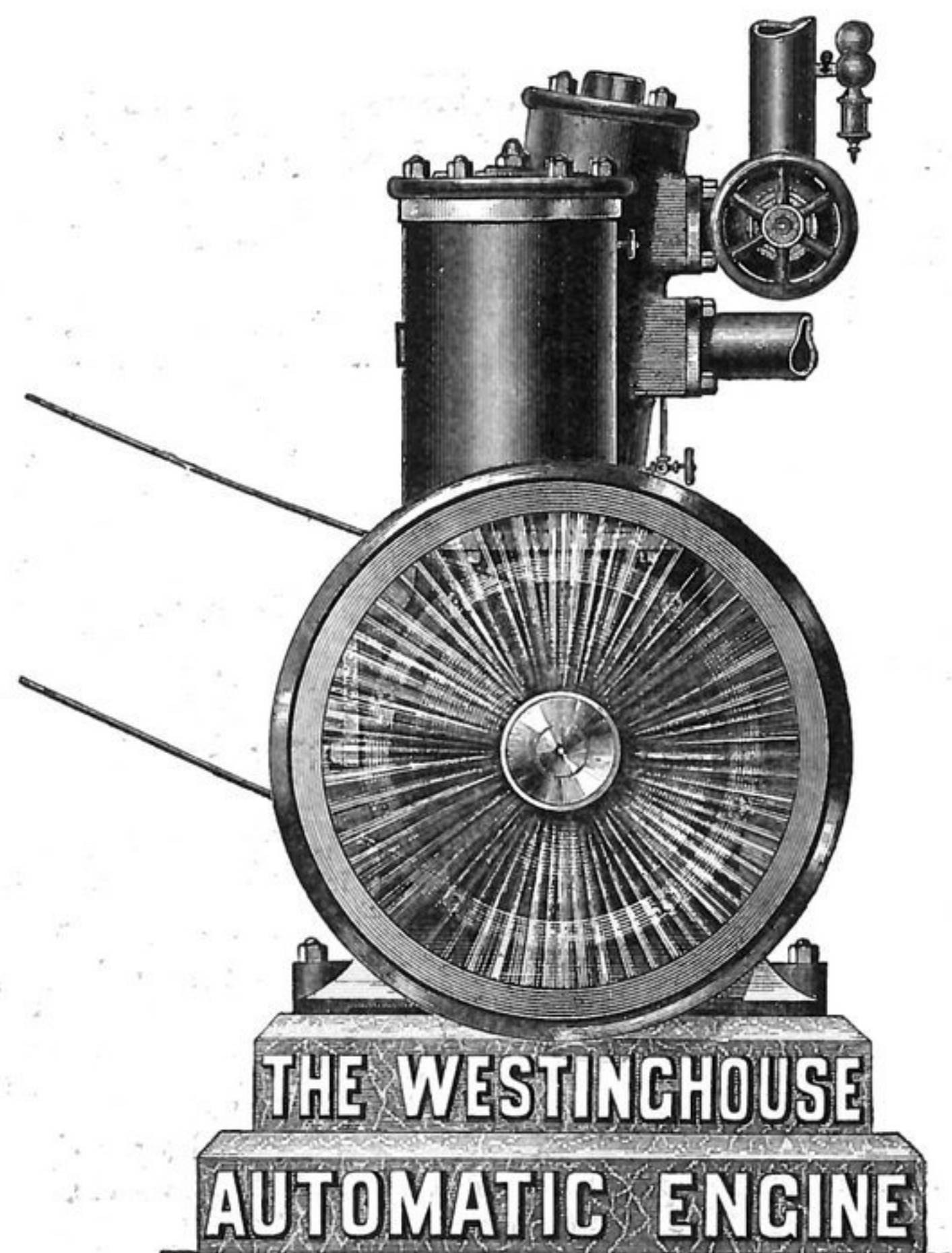
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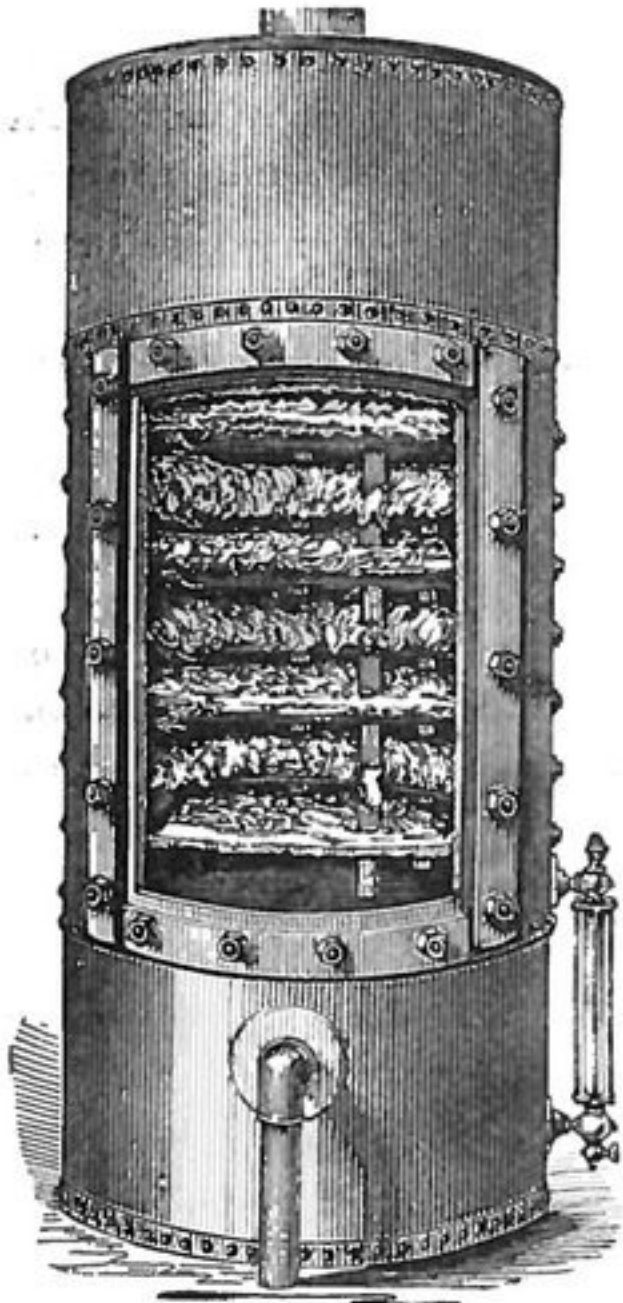
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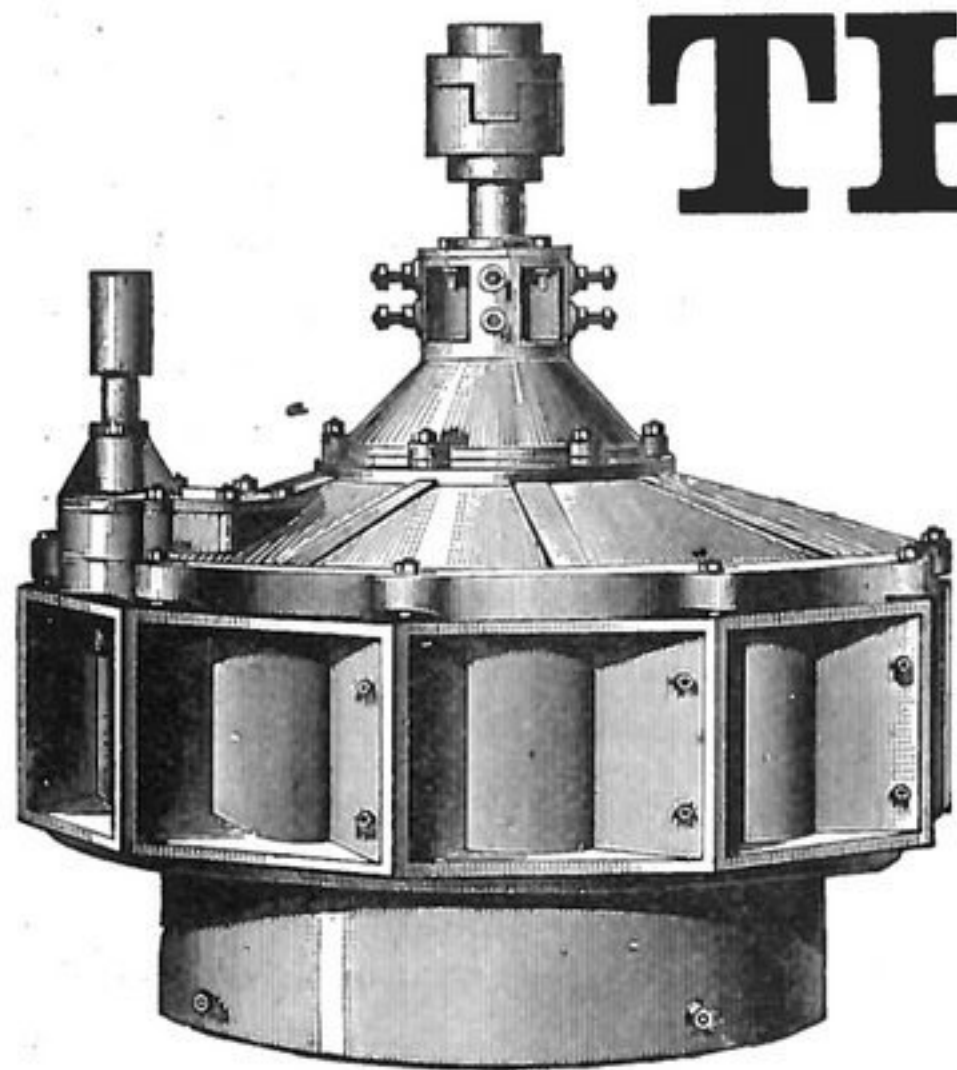


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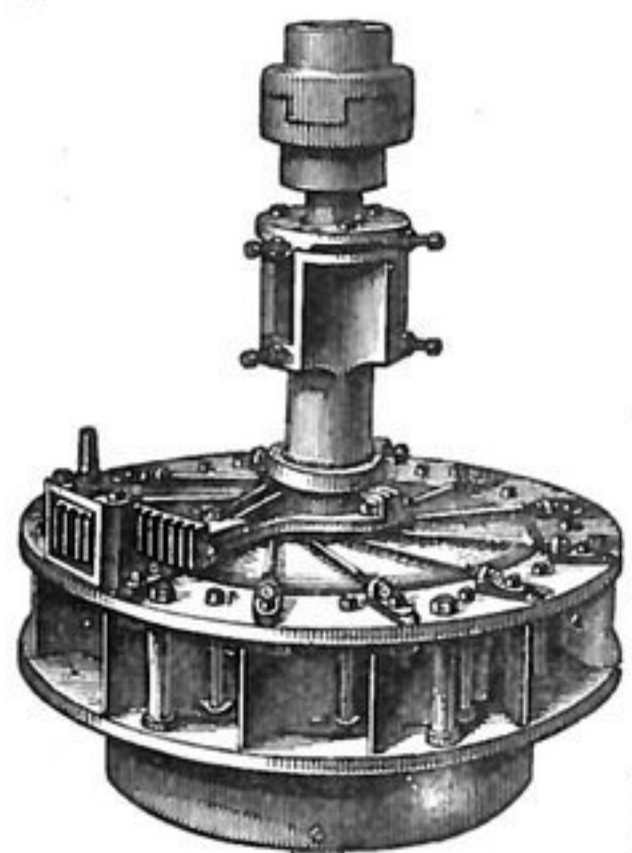
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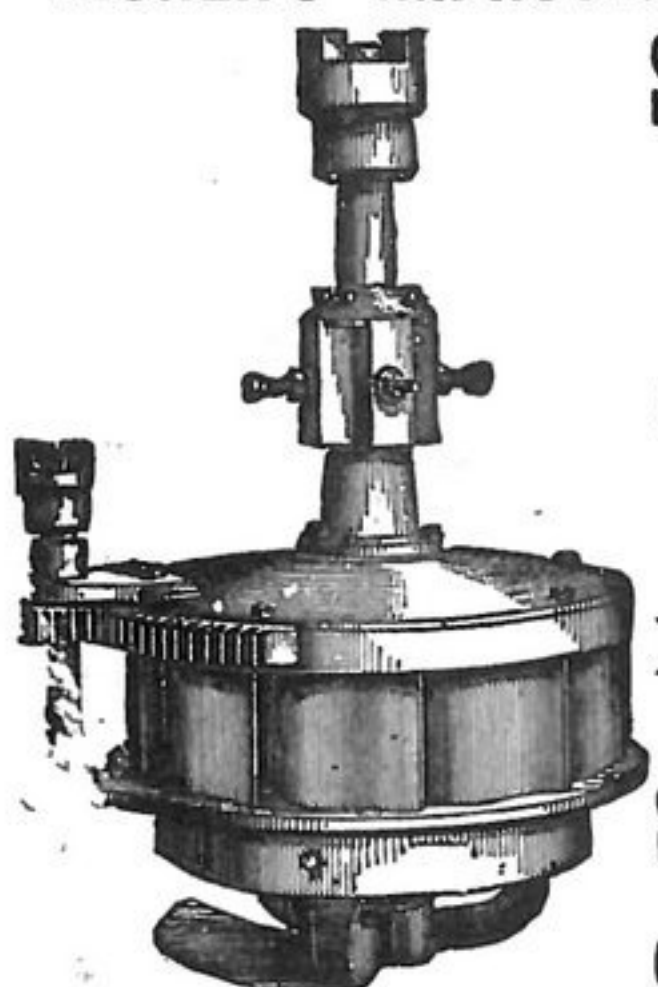


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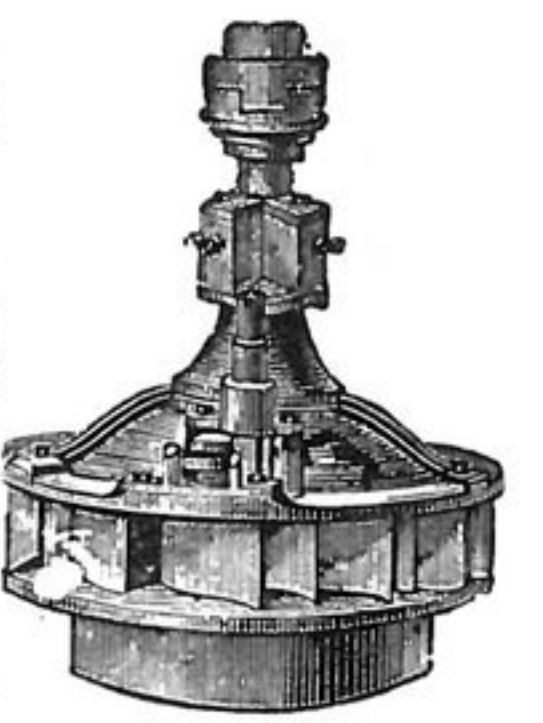
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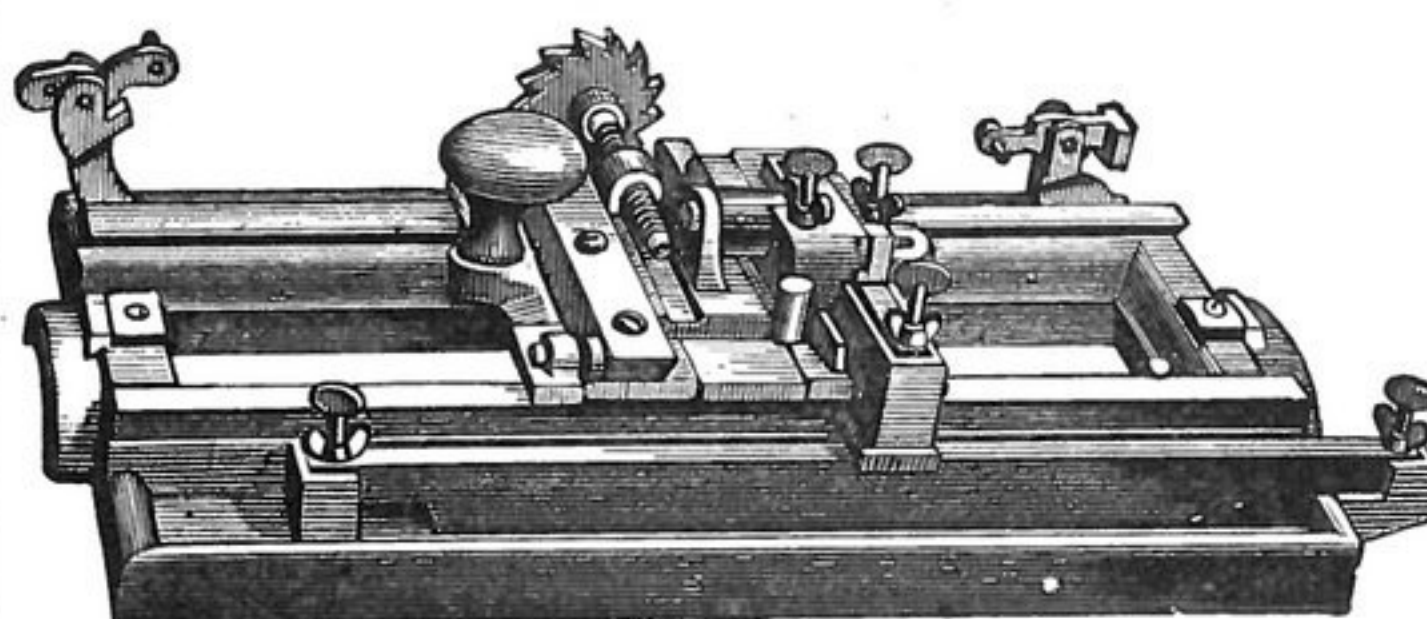
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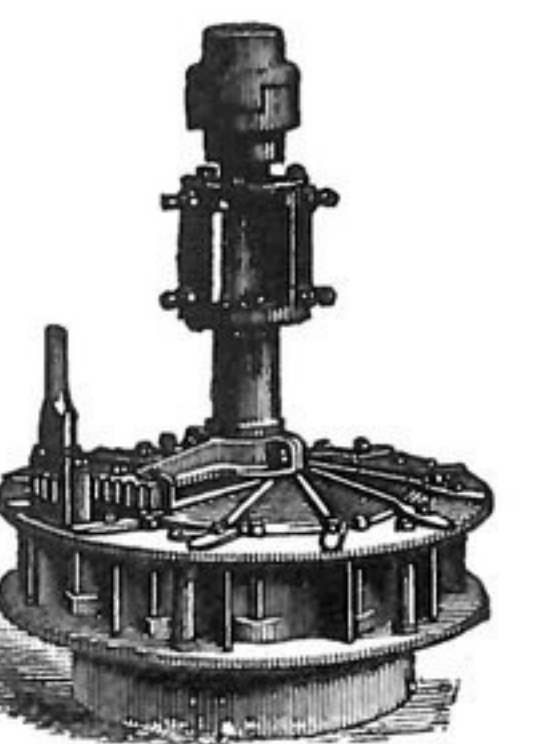
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[From our own correspondent.]

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ING NEW OUTLETS FOR THEIR PRO-  
DUCTS—GOSSIP AND NOTES.

The production of our mills seems to have finally reached a climax in 25,000 bbls per day, and is now going backward. The output for two weeks has been lighter, and there is apparently some grounds for believing that a further falling off will result, though that the production will fall to at all low figures is extremely doubtful. Possibly it will get down to 20,000 bbls daily, but not lower than that, unless the conditions surrounding milling operations become decidedly worse than they are at present. Several things have seemingly conspired to reduced the amount of flour turned out, among others the elements playing an important part. Owing to the absence of flush boards on the west side of the main dam, permitting a large amount of water to run over the apron without utilization, the water in the west side canal has been drawn down considerably, and left those mills formerly using all their power, a little short in this respect. This, together with the mild weather making wheat tough to grind, cut down the output last week to about 24,000 bbls. per day, a loss of 6,000 bbls or more on the six days. The present week, the same mills have not only been again short of power, but anchor ice has begun to run in the river and give nearly all serious trouble. Early Wednesday morning large quantities of ice floated into the west side canal, and so completely choked up the water wheels that all the mills were forced to close down and lay idle several hours. The ice again bothered some Thursday, but Friday was reserved for the worst time. It began to run very thick early in the morning, and forced all the mills on the west side to shut down at times, while those at the lower end of the canal could do little or no work at all. It was slushy and could not be raked out, and come down in a constant stream, making it next to useless to try to run a mill. Most of the lower mills on the west side closed down at six o'clock, and did not undertake to do any more work that night. The ice was never worse and no relief can be expected until the river closes up; and as we have yet to experience any real cold weather, that may not occur for some time yet. The mills had a very serious time last year with ice in the same way, and the period was quite prolonged. These delays are at the heavy expense of a full output, and added to them the idleness of two mills with a capacity of 1,000 bbls., the production of the week has been cut in heavily. It probably not exceeding 110,000 bbls. As to the shortage of water power, that will probably be largely, if not wholly, overcome, as the flush boards are being put on the dam where needed, thus saving the water that is now running to waste.

The flour market is very much depressed, and it is not unlikely that this will have a tendency to cause a falling off in production from the former heavy figures. The St. Anthony mill has been shut down for two weeks to make repairs, on account of business being dull, and the owners of others say that unless the flour trade improves, they will be compelled to curtail their output. There is one feature to the situation however, that will preclude we think, any very heavy falling off in output, except where such things as a shortage of power or the prevalence of anchor ice interpose. This is the fact that a number of the mills have enough orders on their books to keep them in operation for a month yet or more.

Wheat has been fairly steady in the Minneapolis market, fluctuating within a small range; but flour is pretty badly demoralized. Some time ago it was believed that prices had touched bottom, but they continue to sink lower weekly. Buyers do not take hold freely, because the market is a declining one, purchasing from hand to mouth instead; and with each order further concessions are asked for. New fields for the sale of flour are being sought out, and already efforts in this direction have been crowned with encouraging results from the South, where St. Louis mills have heretofore held sway. Advanced ocean and inland freights have had a depressing effect on flour, and take away about the only margin that the miller formerly had. Quotations of flour here in round lots are as follows: Patent, \$4.50@4.80; straight, \$4.20@4.40; first bakers' \$3.35@3.75; second

bakers', \$3.00@3.25; best low grades, \$1.75@2.75 in bags; red dog, \$1.50@1.60 in bags.

The receipts of wheat the past fortnight have been large, and the stock in elevators here and at St. Paul is fast increasing. There are now about three million bushels in this city and over half a million at St. Paul.

The appended table shows the receipts and shipments of Minneapolis for two weeks:

FLOUR.		
Week ending—	Receipts.	Shipments.
	bbls.	bbls.
Nov. 11.....	650	158,091
Nov. 18.....	550	155,698
Total.....	1,200	313,789

WHEAT.		
Week ending—	Receipts.	Shipments.
	bus.	bus.
Nov. 11.....	1,092,700	258,000
" 18.....	960,000	150,000
Total.....	2,052,700	408,000

In our last letter we mentioned the fact that the Mazeppa (Minn.) mill had been sold at an assignee's sale to Paul Hauser, of St. Paul for \$28,000. It seems that this sale was subject to the approval of the creditors, and Mr. Hauser has expressed a fear that his bid would not be accepted. If it is, he will start the mill up as soon as practicable. Should the offer be rejected as too low, another sale will have to be advertised and the prospects would be unfavorable to getting the mill in operation much before spring. Scores of millers are on the ragged edge about the mill being started up, all wanting situations. Several ex-head millers would like to be installed in the mill, and are watching maneuvers closely. Thos. A. Baker, formerly in the Palisade mill, is thought to have the inside track up to date.

Jas. Pye, milling engineer for the Pray Mfg. Co., will put in a good portion of next month at New Orleans. He goes for pleasure, his firm having no exhibit.

Three leading milling firms are about the only ones of the city that will have exhibits at New Orleans. These are C. A. Pillsbury & Co., Washburn, Crosby & Co., and the Sidle, Fletcher, Holmes & Co. Pillsbury & Co. have spared no money in the elaboration of their display, and it will be a very extensive one as well. That of the Sidle, Fletcher, Holmes & Co., will probably be equally as fine, though not on so large a scale. Washburn, Crosby & Co.'s will be extensive, but plain and more as flour and the products which enter into it, are found in the mills here. All three parties have carried on the arrangements as quietly as possible, and few will know what the exhibits actually are until they are seen at the exposition.

W. W. Smith sued Christian Bros. & Co., proprietors of the Crown Roller Mill, for \$10,000 damages for injuries received from falling into the wheel pit of their mill two years ago or over. The case came up in the Circuit Court and Smith was allowed \$500 by the jury. Christian Bros. & Co. claim that the finding was without any legal basis, and say that they will appeal from the verdict.

The St. Anthony mill has been shut down to put in a set of Daverio rolls and make repairs, which will require about two weeks. These rolls give it another break on wheat, increasing the number to six. There is a general inclination to increase the number of breaks heretofore used. Most of the mills employ five and six, but lately two or three have increased the number to seven.

Record was made last week of the transfer of the Palisade Mill from L. Day & Co., to the Washburn Mill Co., through C. E. Pettit, who held the property in trust for the creditors of Day & Co. The consideration named was \$100,000, of this \$40,000 was paid in cash, and a mortgage given for the balance.

Parties who claim to be in a position to know say that they are morally certain that the Lincoln mill at Anoka will be re-erected next year. Men that were employed in fixing up the damaged walls of the former mill, state that when laid off recently, they were informed that work would be resumed in March.

W. H. Putnam, assignee for the Mazeppa Mill Co., announces to the creditors of the company that he will, on Dec. 16, at the office of the company in Red Wing, adjust, allow or reject claims against the company. E. T. Wilder, assignee of the Minnesota Elevator Co., makes a similar announcement.

A. D. Kingsley is building a 100-barrel mill at French Lake, Minn. The Nordyke & Marmon Co. furnish the machinery, and J. D. Edge, of this city, does the millwright work.

Billy Gunn says that he has made arrangements to represent E. P. Allis & Co., but whether he will make Minneapolis his headquarters is not yet settled.

Wm. Helfrich, Thos. Scott and other head millers are considering the matter of visiting the New Orleans Exposition this winter in a party.

With the addition to several mills and the ease

with which the present crop grinds, our mills have a daily capacity of fully 29,000 bbls.

Millwrights are paid \$2.25 to \$3.00 per day here, according to the kind of workmen they are and the class of work to be done.

The Pray Mfg. Co. is overhauling the mill of W. H. Officer, at Austin, Minn., of 75 barrels capacity.

The white beard of J. Silas Leas made its appearance on the platform Friday.

CALEB.  
Minneapolis, Nov. 22, 1884.

## Notes from the Mills.

S. P. Biassaner, of Hickory, N. C., will enlarge his flour mill.

A new flouring mill is contemplated at New Market, Tenn.

There is some talk of erecting a large flour mill at Farmville, Va.

Tinch & Welborn are building a flour mill at Lexington, N. C.

Conger & Son have decided to build a new mill at Jackson, Tenn.

A grain elevator and warehouse are being built at Newbern, N. C.

Askew & Cruce have purchased a site for a flour mill at Newman, Ga.

Frank Watts, of Coopertown, Tenn., will build a saw and grist mill.

The firm of Bull & Nabors, millers, of Desdemona, Tex., has dissolved.

A vein of superior soft coal has been struck in Minnehaha county, Dakota.

A large shipment of flour has been sent to the starved Labrador fishermen.

J. W. Murchinson & Co., grist and saw mill, Trenton, Tenn., have failed.

A new elevator, with a capacity for 50,000 bushels, is in course of construction at Watertown, Minn.

The Harper's Ferry Milling Company, Harper's Ferry, W. Va., is erecting a flour mill to grind 400 barrels of flour a day.

H. A. McLemore & Bro. have purchased the old "Depot Mill," at Columbia, Tenn., and will fit it up for a grist mill.

Peters, Jones & Co., of Knoxville, Tenn., have ordered a full line of machinery, to convert their mill to the roller system.

The Nona Mill Company, of Nona, Texas, was incorporated recently, with a capital of \$50,000, to do a general milling business.

Miller, Woland & Co., Leetonia, O., are putting in breaks, rolls, scalpers, etc., furnished by The Case Mfg. Co., Columbus, O.

M. M. Lyon has sold his mill at Beech Springs, Va., to Josephus Grabeel, and bought a mill at Gravois Mills, Morgan county, Mo.

H. O. Wylie & Co., New Concord, O., is putting in rolls, centrifugal reels, &c., furnished by The Case Mfg. Co., Columbus, O.

The Case Mfg. Co., Columbus, O., has an additional order from A. J. Vanmeter, Miami, Mo., for one improved Case centrifugal reel.

B. M. Allison, of Fairview, W. Va., will improve his mill by the addition of breaks, rolls, scalpers, centrifugal reels, purifiers, etc.

The Case Mfg. Co., Columbus, Ohio, have an order from M. A. Shafer, Aville, Ind., for one "Little Giant" break machine and scalper.

Two additional pairs of rolls with patent automatic feed have been ordered from The Case Mfg. Co., Columbus, O., by J. B. Miller & Co., Ashley, O.

Simpson, Norris & Co., Johnstown, Ohio, are making some changes in their mill and are putting in rolls furnished by The Case Mfg. Co., Columbus, O.

The New Era Mill Company, of Nashville, Tenn., will, within the next few days, place the contract for remodeling their mill to the roller system.

A. Y. Sigmon is building a flouring mill at Hickory, N. C. The building is four stories. The mill will be on the roller system, and will cost \$9,000.

Near Houston, Minn., Nov. 21, the custom mill, belonging to John Phelps, on Money creek, was totally destroyed by fire. Loss, about \$5,000; insurance \$3,000.

The San Francisco *Chronicle* argues at length to induce California farmers, on account of the low price of cereals, to go into what it calls "meat manufacture" for the English market.

While oiling machinery in the Tetonka, Minn., roller mills, S. A. Stromier got his arm drawn into the gearing and terribly lacerated, the member being nearly torn from the socket.

M. S. Crowley, of Brookville, Kan., in order to keep up in the advanced ranks of millers, has ordered one pair of rolls with patent automatic feed, from The Case Mfg. Co., Columbus, O.

Through the Richmond City Mill Works, Richmond, Ind., an order has been given to The Case Mfg. Co., Columbus, O., for one pair of rolls and one single purifier, for Howard & Williams, Hillsborough, Ky.

The value of domestic breadstuffs exported in October was \$1,154,000. The value of the exports for the ten months ending October 31, is \$128,999,980,000, against \$145,125,000 during the corresponding period in 1883.

The contract of Bonesteal & Butler, Janesville, Wis., for a full line of breaks, rolls, purifiers, &c., for a complete roller mill on the "Case" system, using ten pairs of rolls, has been given to The Case Mfg. Co., Columbus, Ohio.

During the five days from Nov. 16 to 20, the Minneapolis Millers' Association purchased about one million bushels of wheat—one of the largest purchases ever made in that length of time—and the elevator men have been compelled to make the "greatest effort of their lives."

Kingston (Canada) forwarding companies have closed all their elevators except one. They state that the grain trade is about over for this season, and are confident from advices received that one elevator can handle all incoming grain from the upper lakes for the balance of the season.

In a recent letter Mr. Samuel Carey, of 17 Broadway, New York City, says: "I have an immense trade in mill picks, orders coming from all parts of the world. I sent a large lot a short while ago to Germany, and so well are they liked it keeps us busy to keep up with the demand."

The Philadelphia *North American* reminds the farmer who is sighing for "the good old times" that in 1816 it took one hundred and fifty pounds of butter to buy one yard of broadcloth, and fifty pounds of cheese to buy twenty-five pounds of nails. Now ten pounds of butter will buy a yard of broadcloth of better quality, and nine pounds of cheese will buy twenty-five pounds of nails.

The flour and other mills using steam power in Dakota, have substituted hay for fuel on account of the difficulty in procuring coal. There are coal mines in the Black Hills, but it is expensive, because there are few railroads in the territory, and their freight charges are excessive. The hay gives a good, steady heat, and raises steam very quickly. It is more economical than coal, and the money paid for the hay is distributed among the farmers of the neighborhood.

The mills in Nashville have been unusually quiet during the past month, says the *Southern Miller*. What, with the excitement attendant upon the election, and the low prices, business has been anything but satisfactory. We hear of but one mill that is behind on orders, keeping about even without being pushed, while one has been idle for the most part during the latter half of the month. One or two of the mills have been cutting prices to the lowest notch, presumably for the purpose of clearing out their surplus stock. As this has now been accomplished, prices have again advanced somewhat.

The following from an Iowa exchange shows how the grain producing centre of the country is gradually going west; and another decade will show it coming south along the Mississippi Valley: "For many years Illinois has stood at the head as a corn producing state, but she is now forced to yield the palm to her younger sister, Iowa, by about 20,000,000, the crop in this state this year being placed at 300,000,000 bushels, and that of Illinois at 270,000,000. Then follows Missouri with 210,000,000, Kansas 200,000,000, Nebraska 130,000,000, Indiana with 100,000,000, no other state producing as much as 100,000,000 bushels."

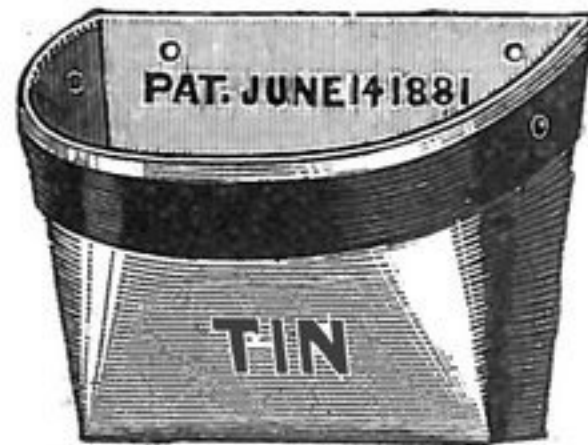
The general prevailing dullness in mill building does not seem to have yet reached the mill building establishment of the Nordyke & Marmon Co., of Indianapolis, Ind., for we are informed, since our last issue, that they have received the following contracts for complete mills and for remodeling old style mills to the roller system: A new roller and stone steam mill for Wiley Bros., of Norwich, Ohio; a new 30-barrel steam mill for Mr. D. L. Yandle, of Marshfield, Mo.; a 100-barrel eight-break steam roller mill, for the Montgomery Milling Company, of Montgomery, Mo.; a new roller mill for Mr. Jacob Allinger, Quincy, Ohio; to remodel the mill of Hinkle, Stickney & Co., of Keota, Iowa; to remodel the mill of Mr. Abner Moore, of Irving, Ill.; new machinery for the Nickells' Roller Mills, Nickells' P. O., West Virginia; to remodel Mr. William Schafer's mill, at Lancaster, Mo.; to remodel Mr. V. F. Ferguson's mill, at Cressline, Kan.; a new mill of 75 barrels capacity, seven breaks, for Mr. A. J. Patterson, of Union Depot, Tenn.



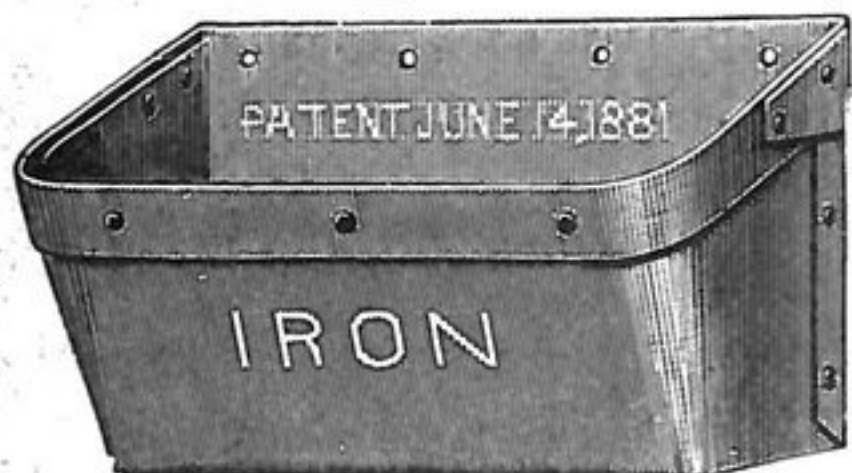
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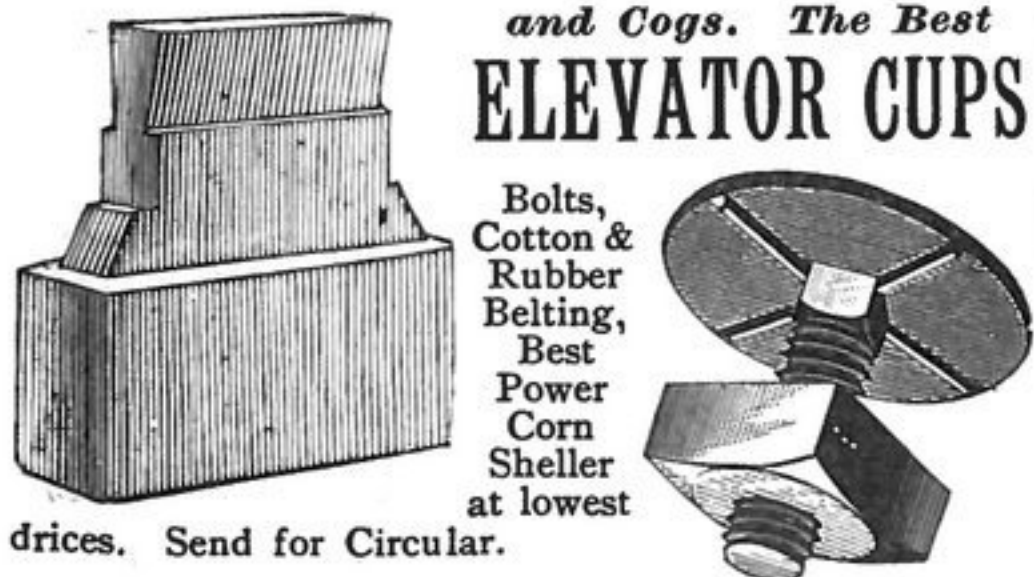
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is gaining favor every day. Over 13,000 sold in one day in three different States. My capacity in my new shops is 6,000 per week. I carry 30,000 cups in stock and can take care of any size order.

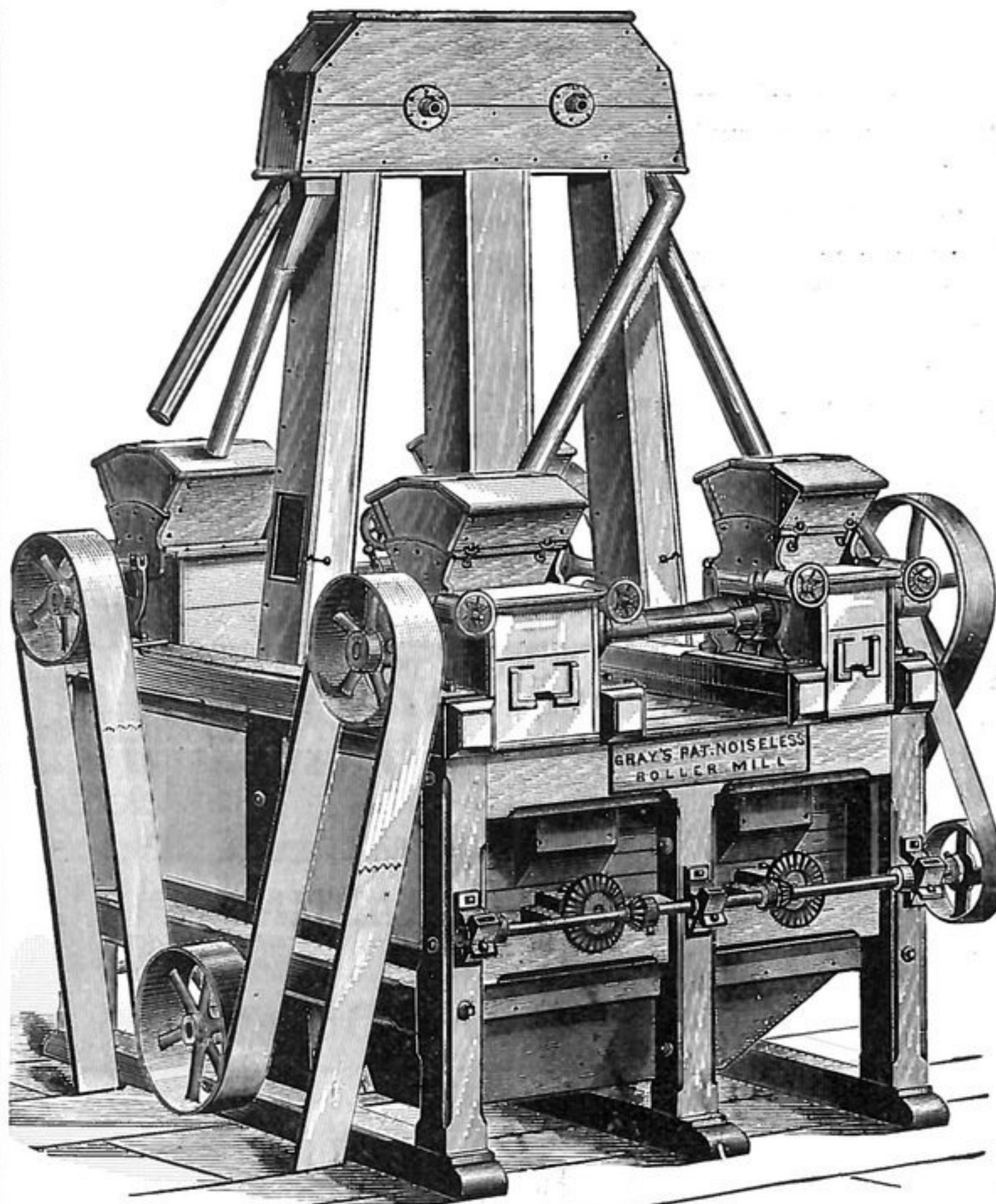


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A. H. FAIRCHILD & SON,  
North Bloomfield, Ont. Co., N. Y.

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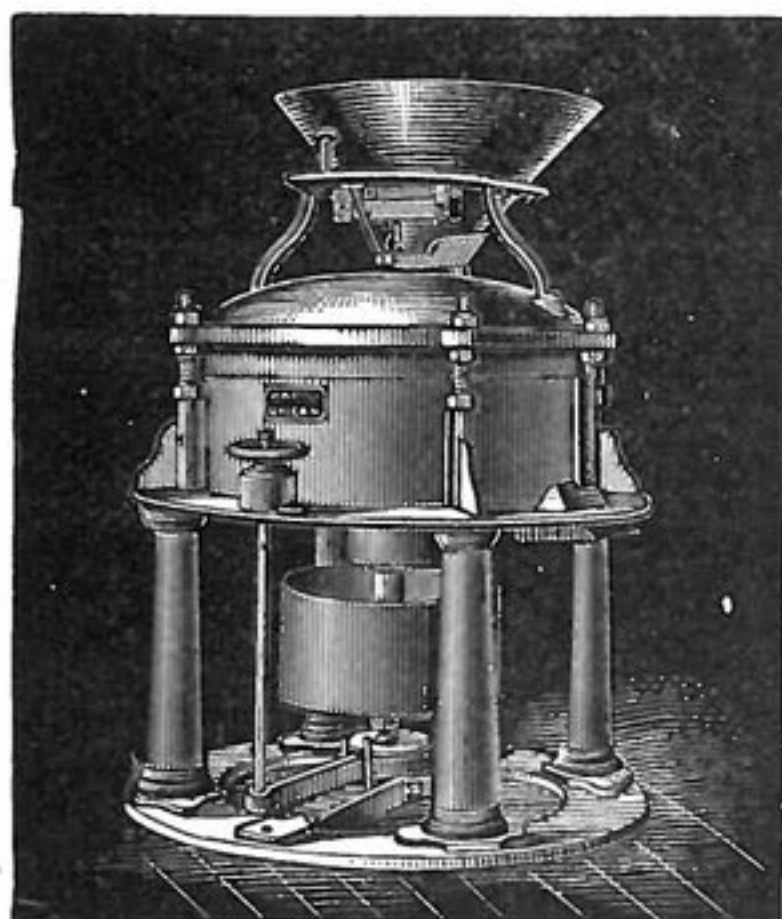
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## FOR SMALL MILLS

*Economizes Room,  
Takes Less Power,  
Saves Millwright Labor.*

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RELIANCE WORKS,  
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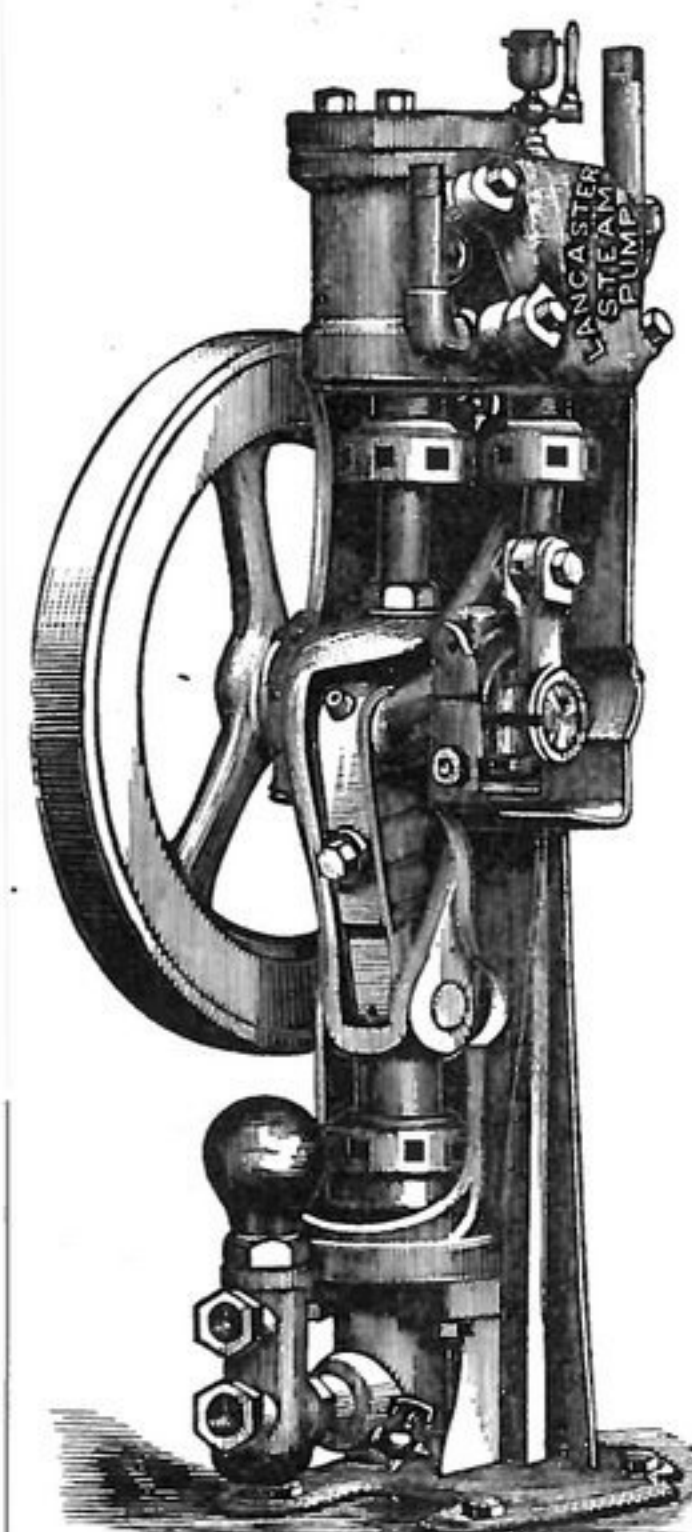
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MANUFACTURERS OF  
Munson's Celebrated Portable Mills,  
FOR WHEAT, MIDDINGS, CORN, FEED, Etc.  
Millstones, Hangings, Bolting Chests, Shafting,  
Gearing, Pulleys, Hangers, Etc.

DEALERS IN EVERY KIND OF  
**MILLING MACHINERY,**  
ENGINES AND BOILERS, WATER WHEELS, Etc.  
**Genuine Dufour Bolting Cloth.**  
Specifications, Estimates and Plans furnished.

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*One to 30 Horse Power,*  
**PRICE, FROM \$125 UPWARDS.**

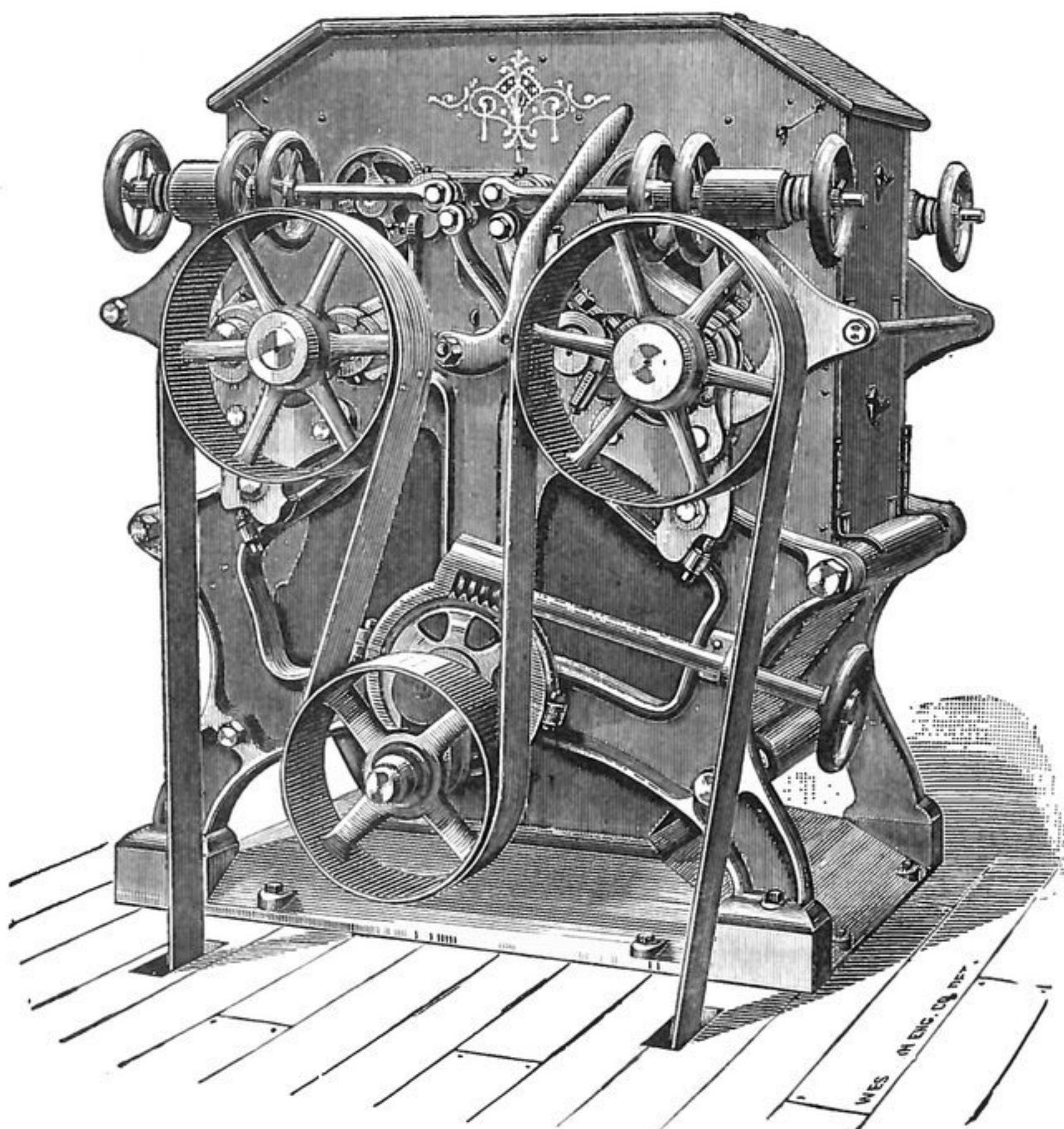
*Steam Pumps, - \$35 and up.  
Eclipse Tire Benders, 15 " "  
Fan Blowers, - - 18 " "  
Tuyere Irons, - - - \$2.50.*

**THE BEST IN THE MARKET!**

For Circulars, Etc., Address,

**THE LANCASTER STEAM PUMP CO.**  
AND MACHINE WORKS,  
EZRA F. LANDIS, PROPRIETOR, LANCASTER, PENN.

## The MILLER ROLLER MILL



Has no superior. Universal Tightener, Automatic Feed, Tight Base, Noiseless, with Non-Cutting Corrugations. We also manufacture the Rider Wheat Break, which has no equal for 1st, 2d and 3d Breaks. Send for Reference and Circulars of our Machines.

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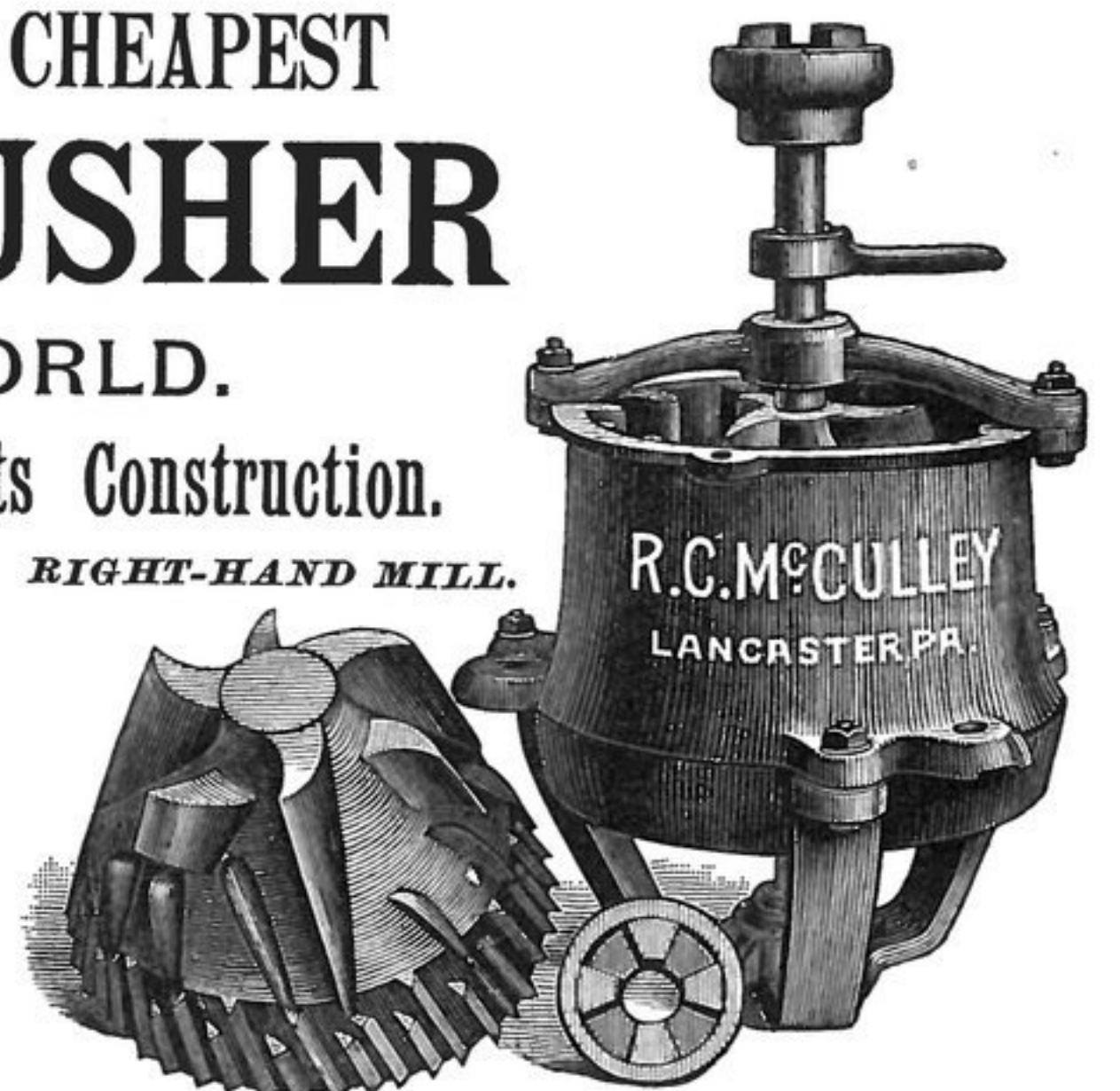
## THE BEST AND CHEAPEST COB CRUSHER IN THE WORLD.

Steel Being Used in its Construction.

AGENTS WANTED EVERYWHERE.  
CAPACITY 75 BUSH. PER HOUR.

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### TECHNICAL SCHOOL FOR MILLERS AND BAKERS.

THE above named school at Vienna embraces quite an extensive course of study for its students, which should be sufficient to make them efficient in the pursuit of their respective callings. The theoretical instruction consists in lectures on the cultivation, estimation, diseases and adulterations of the different grains used in milling and their storage in different ways; engineering in relation to the different milling and baking machinery and water, steam and gas motors; burr stones and their manipulation; the different methods for the production of flour; roller milling in its different forms. Baking in all its particulars, as well as the different systems of ovens in use.

The business course includes a thorough course of book-keeping, banking and mercantile correspondence, with special reference to the milling and baking industry. The practical instruction is devoted to an examination of the different varieties of grain; of analyses of flours to determine their percentage of gluten and their baking qualities. While these practical instructions are given in the laboratory of the school, the students are taken during certain hours to large baking, milling and millwright establishments to obtain a fair view of the practical application of their studies on a large scale.

A course of study like the above, combining theory and practice, should certainly be sufficient to advance the milling and baking industries to the highest standard possible and demonstrates to the world that an exact scientific knowledge of the principles involved is of the greatest advantage to the man who intends to make a success of his business.

### AGRICULTURAL PROSPECTS IN GREAT BRITAIN.

The Executive Committee of the British Agricultural Association will hold a meeting in London during the next month to consider the critical stage of the present British agricultural interests. The conservative "Standard" discusses the object in an impartial manner by admitting that the situation has not a very encouraging aspect, because even the abundant harvest has been unable to counterbalance the prevailing low prices. Nothing but a very heavy decline of the foreign competition will be able to make the production of grain a profitable occupation, and although there are indications pointing in that direction, its accomplishment will be a long time in the future. What is to be done to bridge over the time between now and then. A tariff is impossible, and many farmers are doubtful about the feasibility to exchange stock farming for the grain production. Many look upon a reduction of rents as the cure for all ills, but some of the land owners have already reduced the rents to the lowest possible figure, and the conditions have not improved materially. Although England is at present the only country of free trade, yet it will hold to that policy without doubt. Bread would be dearer if the wheat prices increased, and increase they must with an introduction of grain tariffs, taxing the people at large for the benefit of one class. Free trade is too firmly rooted in England to be in danger of any abolition, and agricultural conventions will do well to devote their energies to the discovery of other more practical and natural ways and means to secure a new lease of life to the flagging agriculture of England, than the advocacy of a re-introduction of tariffs which should never have

existed. It is to be hoped that the sound sense of the Englishmen will guard them against the fallacies into which the people of continental Europe fall again and again, says an Austrian milling journal.

### NOTES.

A French writer says, "The losses of the farmers of France in their grain crops of 1884 are upwards of a thousand milliards of francs."

The stock of flour in Glasgow, on the 1st Nov., was 140,700 sacks, against 212,056 sacks last year, whilst in Liverpool there were 173,000 sacks, against 283,000 sacks last year.

Munich is to be the scene of next year's general meeting of the Association of German Millers. It has been decided to hold the meeting on June 8 to 10 inclusive. A local committee has already been formed in Munich to prepare for the guests.

A fire occurred in Messrs. Heap's rice mill and flour store, in Beckwith street, Liverpool, Oct. 31, by which a considerable amount of damage was done. The building, however, was fire-proof, which confined the damage within the narrow limits.

Referring to the agricultural crisis in France and Europe which has arisen from competition with the product of America, the *Republique Francaise* says that the nations of Europe will not allow themselves to be devoured by the far West, but will assert themselves, and France will lead the way.

At a meeting held in Munich recently it was decided to found a museum for samples of exportable German goods on the same lines as those already working in Stuttgart and Vienna. The following associations were represented at the meeting, which was addressed by several merchants, shippers and manufacturers interested in the matter: The Polytechnic Society, the Gewerbeverein, the Chamber of Commerce for Bavaria and the Association for the Protection of German Trade in Foreign Countries.

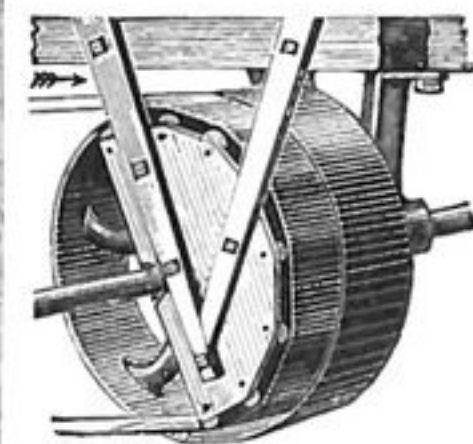
A system of compulsory insurance is to be inaugurated in Germany December 1, under which the benefits to be derived by the sick or disabled workmen are gratuitous medical attendance, medicines and appliances, and after the third day a money allowance equal to half the daily wages, so long as it does not exceed seventy-five cents per day, for thirteen weeks. In case of death a burial allowance will be made amounting to twenty times the daily average wages in the locality. It is expected that the local authorities throughout the Empire will give hearty co-operation to the scheme, as its effect will be to keep down pauperism.

On Nov. 4 last the foundation-stone of another large warehouse for the storage of grain was laid at the Surrey Commercial Docks, at Rotherhithe, England, by the deputy chairman of the Dock Company, F. Strang, Esq., in the presence of several of the directors and the leading officers of the company. Underneath the stone was placed a glass bottle containing a copy of that day's *Times*, several current coins, and a copy of the "History of the Docks," written by the secretary, Mr. Griffin, which, on the authority of Stowe, traces back the historical associations of the site to the time when Canute, the Dane, cut hereabouts his famous channel when he laid siege to London in the tenth century. The warehouse will be built by Mr. W. Brass, from the designs and under the supervision of Mr. Maconnachie, the company's engineer, and will have six floors and a storage capacity of 50,000 quarters, which will make the total capacity of the company's granaries about 270,000 quarters. The warehouse will be fitted with hydraulic machinery by Sir W. G. Armstrong & Co., for lifting and conveying the grain to the several floors. This machinery is arranged on a new system, and in connection with the hydraulic cranes on the quay, for working the grain out of the ship, will enable the company to deal with cargoes in the expeditious manner now required by the grain trade. The Surrey Commercial Dock Company seem resolved to keep pace with the times, and this their new undertaking is a further development of their enterprise.

The Fair Trade League seems to be decidedly on the increase in the populous parts of England. An address has been widely disseminated by the West Suffolk Branch that presents a statement of the views of the League, and urges the general co-operation of land owners, farmers, and tradesmen. The address sets forth that the more the present condition is examined, the more injurious appears the present one-sided fiscal policy. The country is taxed, says the address, more than \$95,000,000 import duties on articles that cannot be

produced there, a larger per capita sum than is levied by any European country except Denmark; and of this \$45,000,000 is on tea and tobacco. The bulk of the articles admitted free are such as the country can produce, while those taxed cannot be produced in the United Kingdom. Comparing 1869 with 1884, the loss in wheat, valued at the same price, is \$60,000,000, and taking the actual prices the loss on the present crop so compared is \$105,000,000 to the producer. Meanwhile other agricultural products have also decreased in value. The trade of the country, as shown by the value of assessed lands, has also declined, these values being \$4,000,000 less in 1881 than in 1868. There has been a recovery this year of \$60,000,000, and the excess of imports that had averaged \$625,000,000 the previous four years had decreased by \$100,000,000. The British exports had decreased from \$1,240,000,000 in 1872 to \$1,075,000,000 in 1883; during the same period the imports had increased from \$1,375,000,000 to \$1,640,000,000. On the other hand, the imports from British Possessions had increased from \$395,000,000 to \$490,000,000, and the exports from \$395,000,000 to \$490,000,000, a condition the Fair Traders wish to foster. The much desired Confederation of the Empire, says the article, is dependent on a Customs' Union between the mother country and her dependencies; and to this end the British public are urged to join in this movement.

### The Wellington Belt Holder.



#### A NEW IDEA!

BETTER AND CHEAPER THAN LOOSE PULLEYS.  
BETTER AND FAR CHEAPER THAN DEAD PULLEYS.  
Our Customers Like It and Order More.

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**RIVAL STEAM PUMPS**  
THE CHEAPEST AND THE BEST FOR HOT & COLD WATER. \$35.00 AND UPWARDS.  
15 SIZES MANUFACTURED BY JOHN H. MCGOWAN & CO. CINCINNATI, OHIO.

**CORN & COB CRUSHERS**  
PRICE, \$15.00.  
Send For Circular.  
SHAFTING, PULLEYS & HANGERS.  
Pulleys a Specialty, Large or Small. Address,  
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It Never Fails to Spread the Entire Length of the Roll.

It Cuts Itself Off Before the Roll Stops.

It Does not Begin to Feed Until the Roll is in Motion.

It Feeds Every Class of Stock With Equal Uniformity

It Requires No Attention From One Year's End to the Other.

It Makes a Uniform Product and Reduces the Low Grade.

This important element of our Rolls and Purifiers is being infringed by others. We own and control exclusively under a large number of patents, this **VIBRATORY FEED**, and it has become necessary for us to notify the millers that we are about to enter suit against all parties infringing our rights. Write us for low prices on Rolls, Purifiers, Centrifugal Reels, &c.

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COLUMBUS, OHIO.**

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SHOVEL EDGE  
Seamless Rounded Corners  
CURVED HEEL.



RUNS EASY  
STRONG & DURABLE  
EMPTIES CLEAN.

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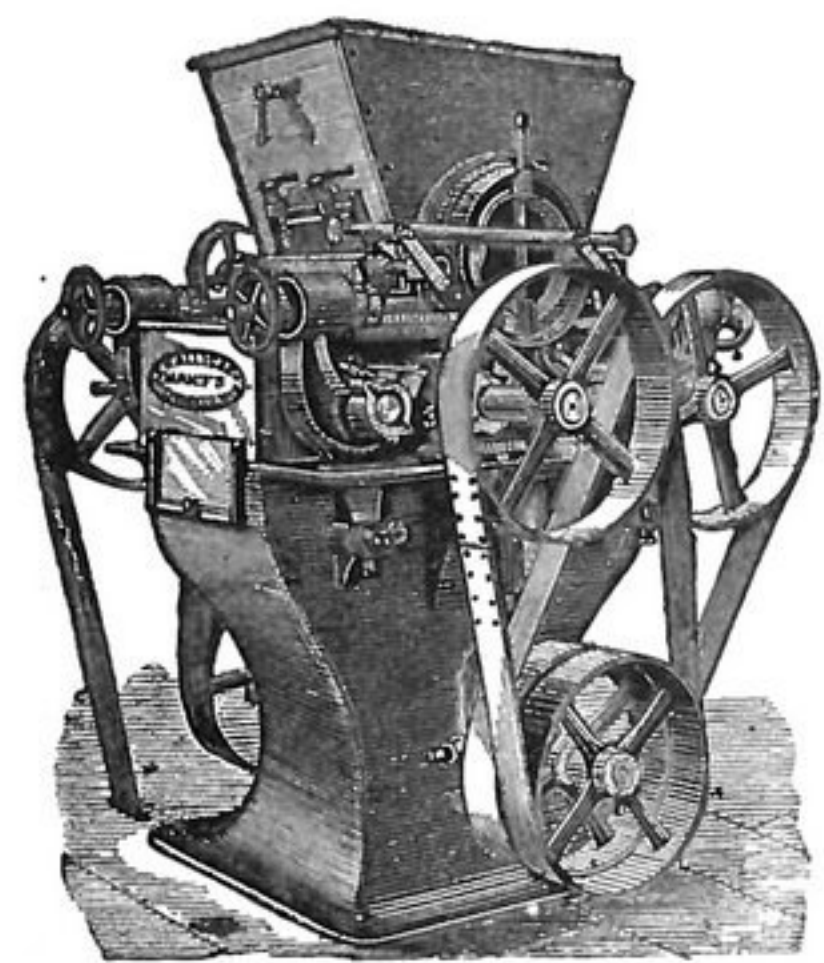
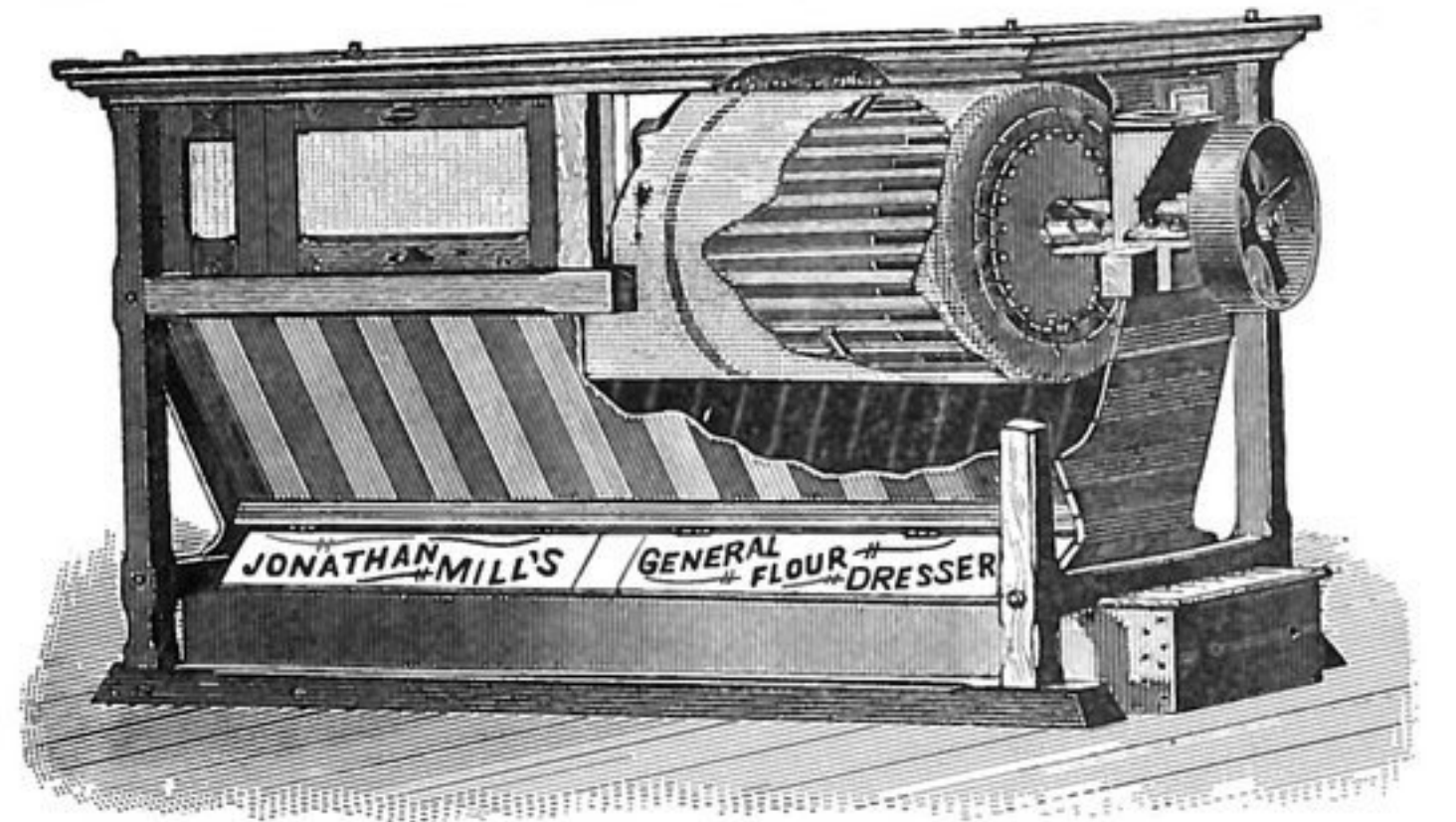
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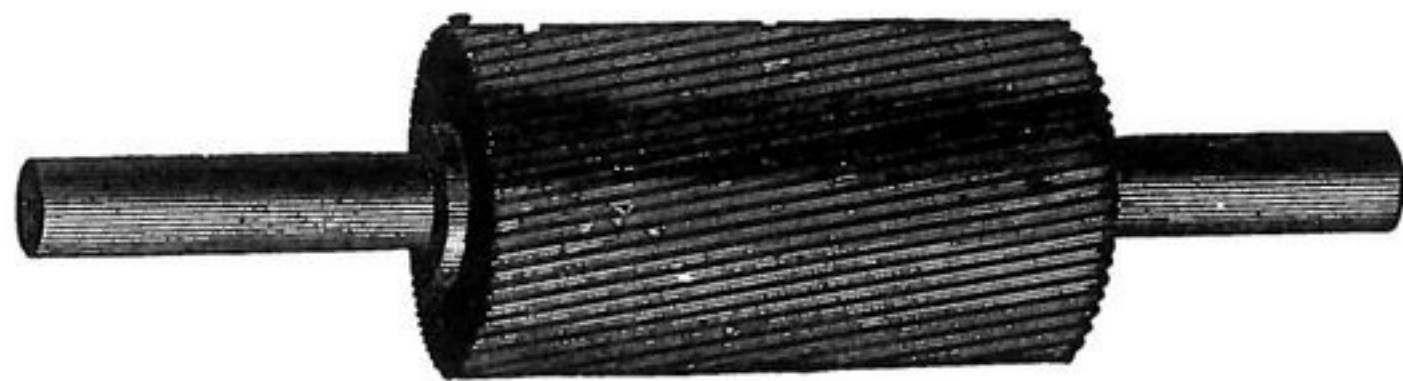
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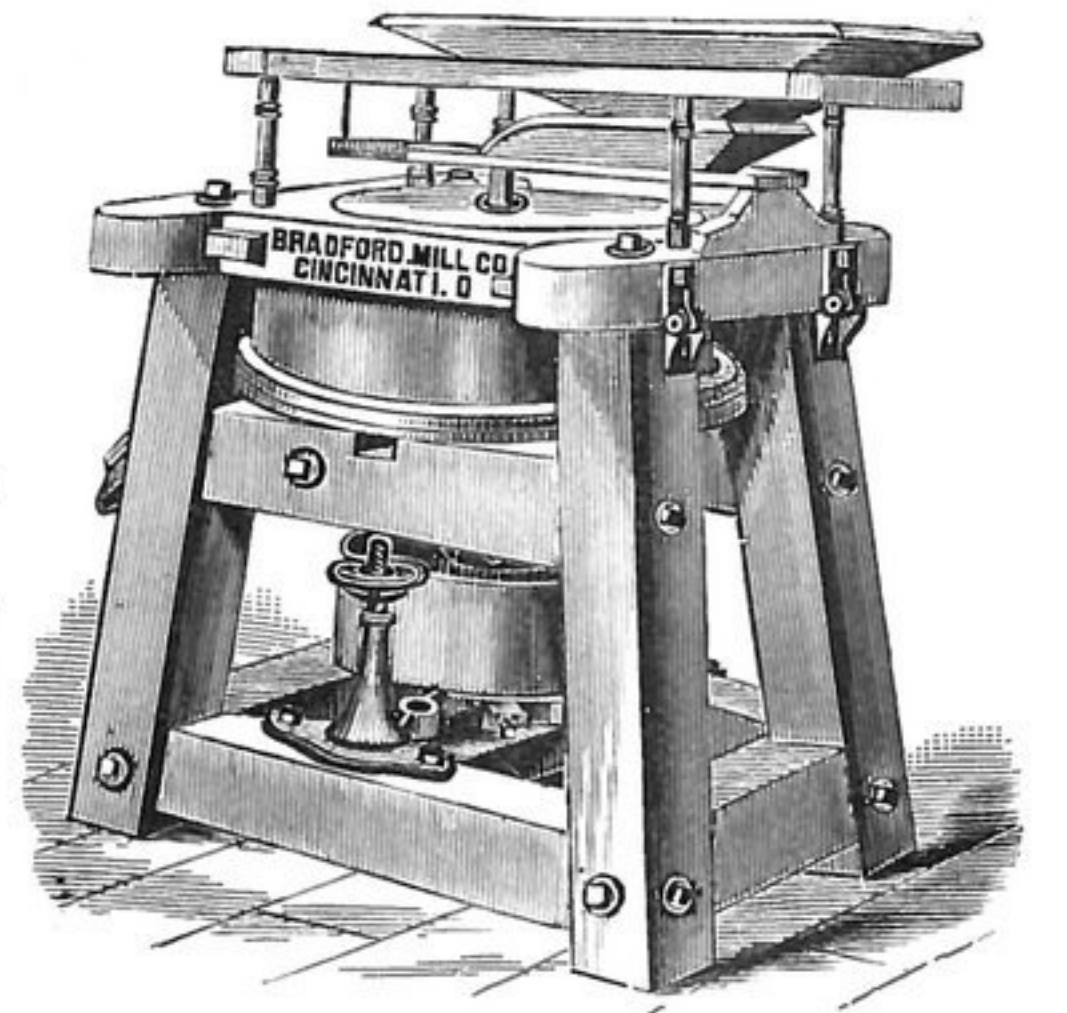
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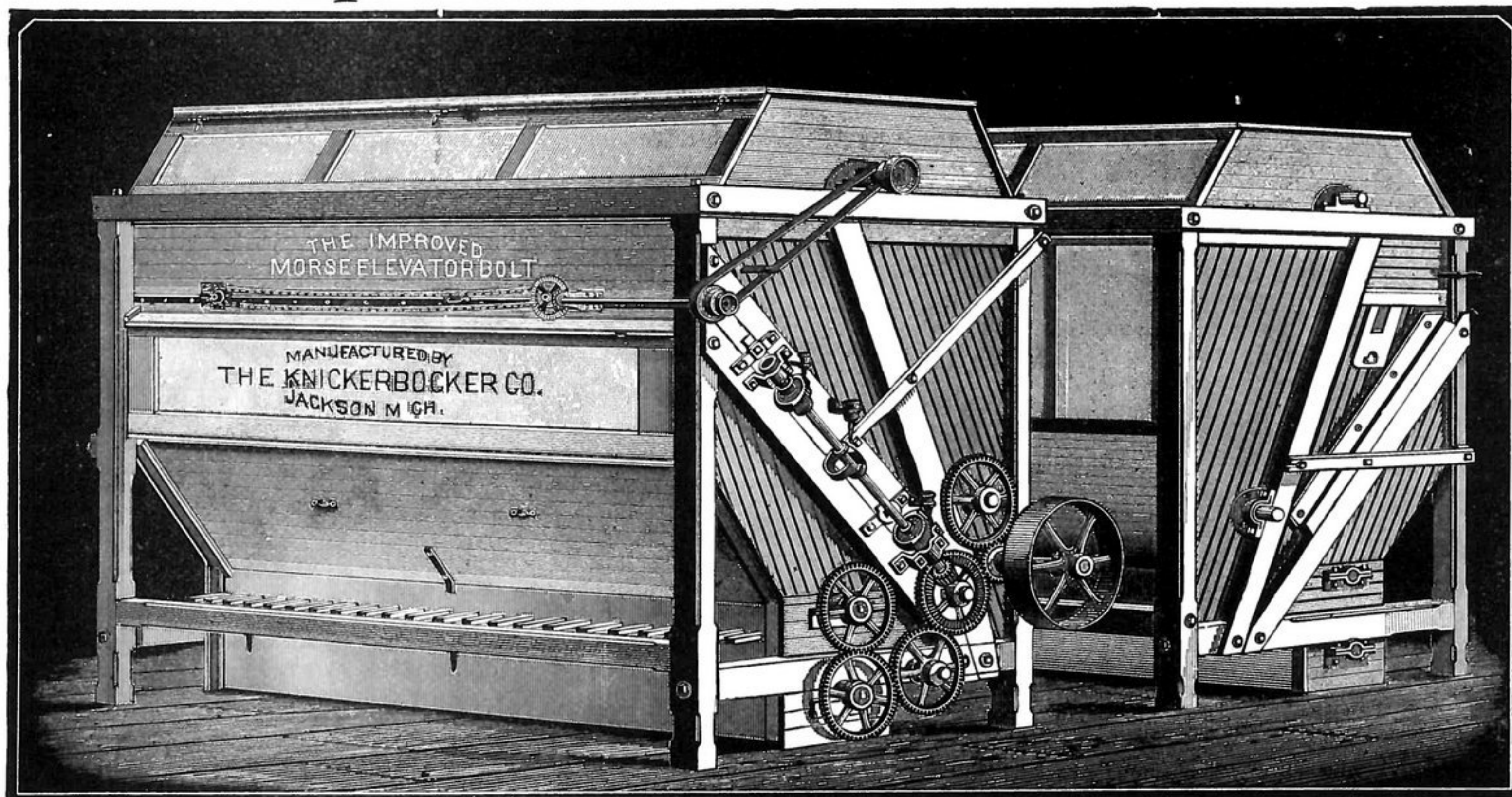


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DEMONSTRATED IN OVER 100 MILLS TO BE THE BEST BOLTING DEVICE KNOWN.

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A tool for Cutting, Leveling and Polishing the Furrows and Face of Millstones.

Eight inches long, 2 1/2 inches wide, 1 1/2 inches thick. Received the highest and only Award given to Polishers at the Millers' Exhibition, Cincinnati, Ohio, June, 1880.

For facing down high places on the buhr, this tool has no equal, and can be done much better and in one-sixth the time than with the mill pick. It is much larger, cuts better, can be used on either face or furrow, can be used until the corundum is entirely worn out on one side and then turned on the other side. Has over four times the amount of corundum and when the corundum is worn out can be replaced in the handle at a small cost. Sent by express, \$3.50. Satisfaction guaranteed, or money refunded. Address

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All Warranted made of Best Quality Cast Steel 50 cents per pound.

All Sizes in Stock.

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Send for New Catalogue and Price List Just Out, to

**SAMUEL CAREY, No. 17 BROADWAY, NEW YORK.**

CAREY'S DOUBLE ANCHOR BOLTING CLOTH.



HAS BEEN AWARDED  
FIRST AND ONLY PREMIUM  
AT THE  
Millers' International Exhibition.



Office of THE MILLING WORLD.  
Buffalo, N. Y., Nov. 26, 1884.

A slightly firmer feeling is manifested in grain circles, but it is too soon to base an opinion as to its permanency. The New York Bulletin says: Cable advices, public and private, support the idea of fairly sustained markets abroad, with wheat firm in the United Kingdom and in the Continental markets, and a fairly active demand in all. This has been one of the features tending to firmness here, but the increase in the visible supply of wheat in the United States and Canada, made apparent by the official calculations both here and at the West, was surprisingly large; the New York figures are fully one-third larger than had been expected. The interior movement is subsiding. The total receipts of spring wheat today, Nov. 25, were 1,069 cars, against 1,114 cars a week ago, and 1,031 cars yesterday. The exports from the Atlantic Seaboard show, as compared with last week's figures, an increase of 10,000 barrels flour; a decrease of 331,000 bushels of wheat, and an increase of 229,000 bushels corn. There has been rather less speculative vim to the market to-day, and less strength. The unexpectedly large increase in the "visible" furnished the check. There has, however, been a good deal of "scalping" on a large scale, and the option market may be termed as fairly active and offering good opportunities for small turns. Cash wheat has been held for an advance of  $\frac{1}{2}$  to  $\frac{3}{4}$ ¢—a fact which partially explains the moderate takings of exporters, whose orders, while fairly extensive, have been too much out of working limits. There has, however, been a moderate business for foreign account, and a better inquiry for rail wheat for local milling. The latest private cable dispatches call the foreign markets quiet. Afternoon dispatches from the West indicate a rather firmer undertone, based on the moderating receipts.

The flour market is holding its own as to price; buyers are coming up a little better with their bids and the market may be called more active. Receipts are full and holders are disposed to meet the demand without asking an advance, rather than store the arrivals. Rye flour is steady, with a fair demand at full prices. The demand for buckwheat flour is good, but everybody wants the best that is made, and flour that is offered at \$2 is waiting for buyers, while the best at \$2.30 sells quickly. The market for corn goods is quiet but firm; prices unchanged; supplies moderate. The mill feed market is generally dull; bran is the exception; for that a steady market and fair demand.

#### BUFFALO WHEAT MARKET.

Buffalo, Nov. 26, 1884.

Wheat market strong all round. No. 1 hard held this morning at 85¢. Sales made yesterday at 83¢@84¢; No. 1 white 81¢; No. 2 red 80¢@80½¢; No. 1 long berry 85¢; No. 2 81¢@81½¢. Corn in fair demand for car loads. New mixed 43½¢@44¢. Choice new high mixed 46¢. Oats 30¢@31¢, for No. 2 white and mixed western selling from teams delivered at 33¢.

J. McGOWAN & SON.

#### BUFFALO MARKETS.

FLOUR—Straight ground clear Northern Pacific spring \$4.50@5.00; city Northern Pacific spring, \$5.00@5.50; amber, \$5.00@5.15; white winter, \$4.75@5.25; new process, \$6.00@6.50; Graham flour, \$4.00@5.00. Western straight Minnesota bakers, \$4.75@5.00; clear do, \$4.50@5.00; white winter, \$4.75@5.00; new process, \$6.00@6.50; low grade flour, \$2.50@4.00. OATMEAL—Ingersol \$5.75; Bannerman's \$6.00; Akron \$6.25. CORNMEAL—Coarse, \$1.00; fine, \$1.10 per cwt. RYE FLOUR—In fair demand \$1.00@1.25. WHEAT—Holders firm. Sales one car-load No. 1 hard Northern Pacific at 81¢, one do. at 81½¢, and 700 bu. No. 2 Northern at 71¢. For No. 1 hard, at the Call Board, 83¢, asked 81½¢, bid cash, asked year, 90¢, asked 81¢, bid May. Winter wheat quiet. Sale one car-load No. 2 longberry at 86¢. CORN—Quiet. Sales 1,000 bu. old No. 2 at 48¢, 5,000 bu. old and new mixed at 43¢, in store, one car-load new mixed at 43¢, one do. do. at 44¢, two do. high mixed yellow at 45½¢, and two do. special bin at 45¢. OATS—Steady. Sales two car-loads No. 2 white at 31¢@31½¢. BARLEY—Market quiet at 70¢@85¢ for Canadian and 60¢@75¢ for State. RYE—Quiet. Sale one car-load choice sample at 59¢.

#### FOREIGN EXCHANGE.

The demand was moderate and rates only fairly steady. Posted rates closed at 4.82 for 60 days' and 4.86 for demand. The actual rates ranged: At 60 days' sight, 4.81¼@4.81½; demand, 4.85@

## DUFOUR & CO.'S CELEBRATED BOLTING CLOTH.

4.85½; cables, 4.85½@4.86, and commercial, 4.80@4.80½. Continental exchange quiet and firm; francs, 5.25@5.24½ and 5.21½; reichsmarks, 94½@94¾ and 94¾@95; guilders, 39¾@39¾ and 40¾. The closing rates were as follows:

	60 days.	30 days.
London.....	4 82	4 86
Paris francs.....	5 23½	5 20
Geneva.....	5 22½	5 19½
Berlin, reichsmarks.....	94½	95¼
Amsterdam, guilders.....	40	40¼

#### NOTES.

M. J. Parrott & Sons, millers, Strawberry Plains, Tenn., have been burned out; not insured.

Richter & Co., of-Williamstown, W. Va., will soon make some improvements in their mill.

Y. M. Rizer, miller, Franklin, Tenn., has assigned. Liabilities, \$75,000; assets, \$30,000.

Applegate & Hamilton, of Falmouth, Ky., have decided to build a corn meal mill at that place.

D. H. Turner, of Pearson's Mills, Ala., has ordered the machinery for a three-run new process mill.

S. Routzong's mill at Covington, Ky., was recently burned. Loss, \$18,000 to \$20,000; insurance, \$15,000.

Sam H. Bradley, of Mendon, Ill., proprietor of the Hendon Mills, has made an assignment for the benefit of his creditors. The liabilities are about \$40,000. And assets, if fairly realized upon, will nearly cover.

At Evansville, Ind., Nov. 20, McCutchan's flour mill was discovered to be on fire. Prompt action, saved the building, with little damage. The principal loss was to stock, caused by water. The fire was the work of an incendiary. The loss is \$4,000, insured for \$2,000.

Great indignation has been occasioned among the grain men in Winnipeg, by a despatch sent from Ottawa to St. Paul, on the strength of information said to have been obtained from McKay & Co., Ontario millers, reflecting severely on western wheat. The statement was that what had been purchased as No. 1 hard Manitoba proved to be too soft, besides being smutty, to make baker's flour. The explanation that comes from Winnipeg is that this wheat had never been inspected by Manitoba inspectors, and had not passed through an elevator. This sample does not seem to be representative Manitoba wheat even No. 2.

The Canadian Pacific Railway will dispatch a special grand exhibit to England for distribution throughout the various agencies, with the object of promoting the tide of immigration to the Dominion. The exhibit, which is a most elaborate one, is made up of the products of the Canadian Pacific Railway experimental farms, and consists of samples and roots. There are in all, upwards of sixty-five bags of grain and cases of roots. Specimens of about 600 bushels of selected grain has reached Toronto, and has been offered for sale. A portion of the Canadian Pacific exhibit will be on view at various exhibitions throughout England and the continent.

Pennsylvania does not do anything by halves. It produces more manufactured iron and steel than any other State in the Union and more coal and oil than all the others combined, says the Philadelphia Times. In the matter of growing tobacco to solace the chewers and smokers it doesn't take a back seat either. It turns out more carpets than any other State, and there is scarcely an important industry in the country in which the Keystone State doesn't stand in the front rank. One would naturally suppose, in view of the immense development of the manufacturing and mining interests of the state, that agriculture would hold a secondary place in its list of great industries. With so many millions of workers to be fed, it would hardly be expected that bread enough for every hungry mouth would be grown on Pennsylvania soil. Marvelous as it may seem, however, the reports collected by the official reporters of the State Board of Agriculture show the last wheat crop of the state to have been 23,000,000 bushels. This amount will furnish the bread for the entire population of the state, the seed for the next crop and leave a surplus of three-quarters of a million of bushels for people who can't grow their own wheat.

Millers in eastern Canada, says the Pioneer Press, are striving to have the duty on American wheat and flour equalized. There are now duties of 50 cents a barrel on flour, and 15 cents a bushel on wheat. The duty on wheat is too large for that on flour, so that it pays to import flour rather than wheat for milling purposes. Milling throughout the country is, therefore, in bad condition, and

many firms have gone to the wall. The sole reason given by the government to numerous delegations for not reducing the duty on wheat is such action would be detrimental to the wheat trade of the Northwest, is supposed to find a market in eastern Canada. McKay & Co., of Ottawa, the largest millers in Canada have always received three-fourths of their wheat from Duluth, but have recently made shipments of Manitoba "No. 1 special hard." Being examined it showed that it not only suffered from smut and growth, but was too soft to make bakers' flour, for which it was intended, and it is said to be barely equal to No. 2 Duluth. Thus it will be seen that Manitoba wheat will not do for mixing with Canadian soft, and that, therefore the million bushels spoken of in the Northwest will not in any way interfere with the amount of wheat which is annually imported to Canada from the western states.

Governor Pierce, of Dakota, has submitted his first annual report to the Department of the Interior. He quotes a letter from C. B. Lamborn, of the Northern Pacific road, in which he estimates the wheat crop of Dakota in 1884 at 28,000,000 to 30,000,000 bushels. This letter also alludes to the fact that large shipments of stock from Western Dakota have already begun, about 20,000 head having been shipped during the present season for the farmers of Dakota. Governor Pierce says they have had but one discouraging thing with which to contend this year—the low price of crops. The experience of the past year has also shown that northern Dakota is valuable as a corn growing region, though its especial importance as a wheat field is still recognized. The cultivation of flax, barley and rye, as well as the raising of stock, is now receiving more attention, because of the extreme low prices of wheat. Fruit raising has also proven very satisfactory, so far as experiments have been conducted. The amount of land disposed of in Dakota by the Government during the year was about six million acres to private parties, and five million on claims to railroads hereafter, to be adjudicated—an area three times the size of the state of Massachusetts. The Northern Pacific railroad has also sold 180,000 acres in the Territory during the year.

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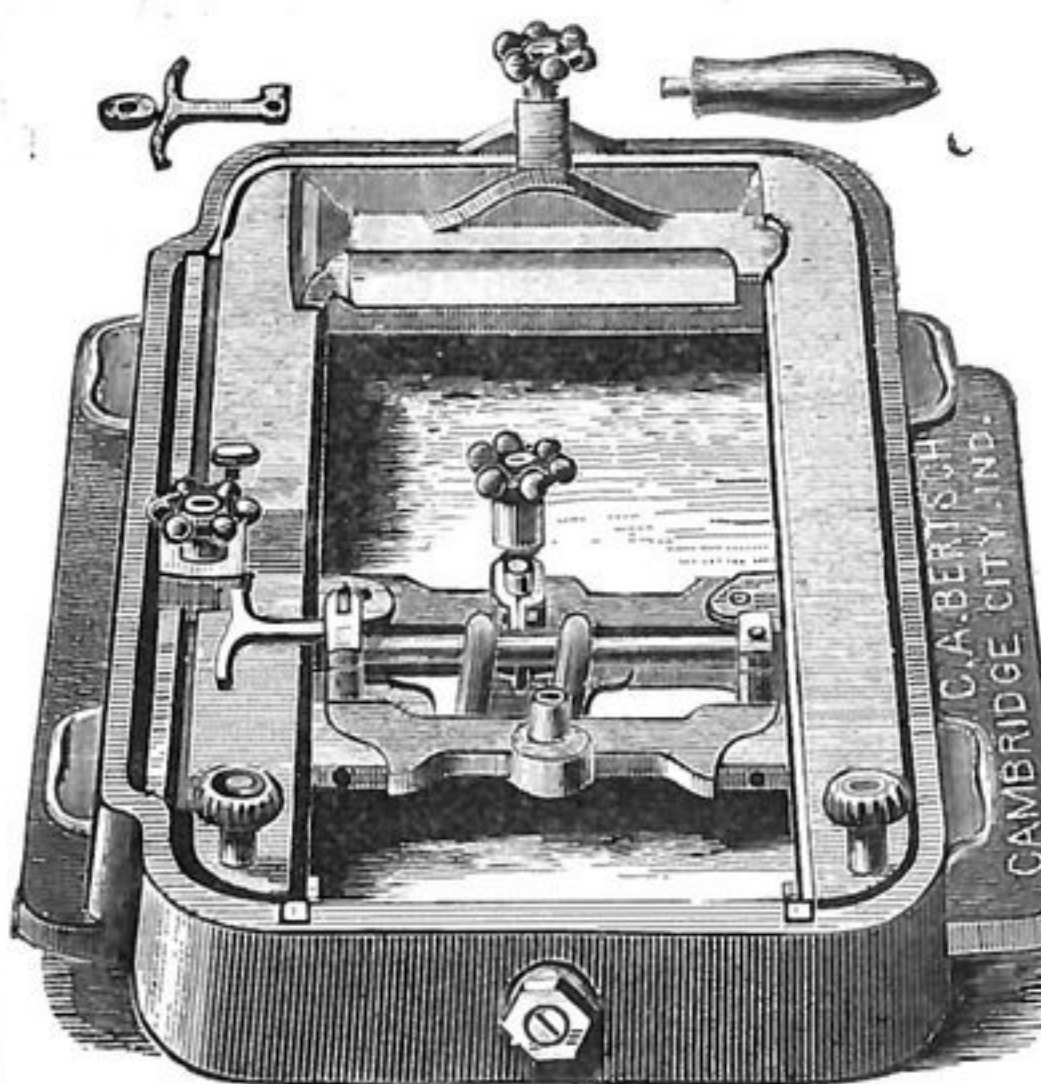
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Picks will be sent on 30 or 60 days' trial to any responsible Miller in the United States or Canada, and if not superior in every respect to any other pick made in this or any other country, there will be no charge, and I will pay all express charges to and from Chicago. All my picks are made of a special steel, which is manufactured expressly for me at Sheffield, England. My customers can thus be assured of a good article, and share with me the profits of direct importation. References furnished from every State and Territory in the United States and Canada.

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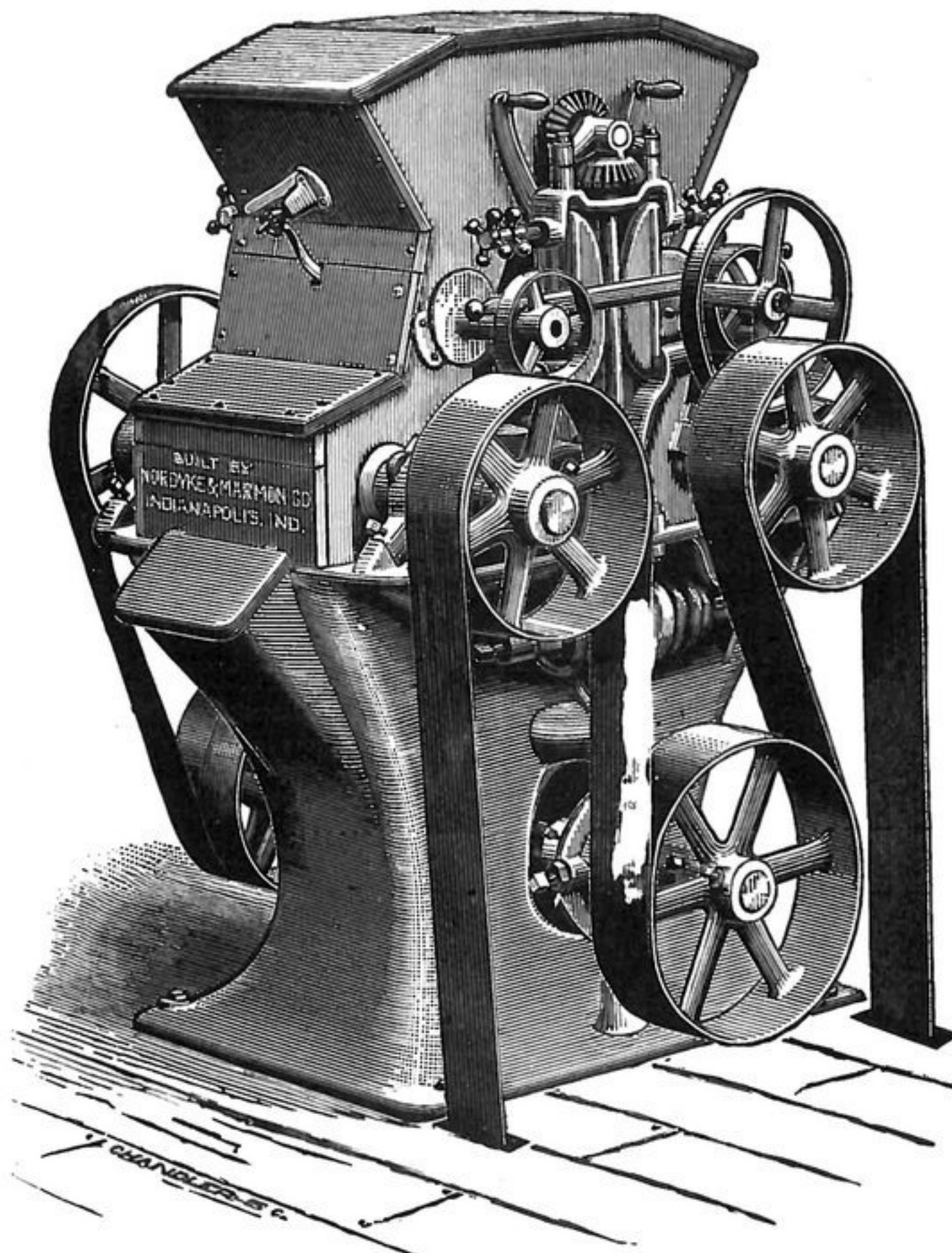


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300 BARREL MILL IN MISSOURI.

Read what an Old Miller who has Thirty-Four Pairs of these Rolls in Constant Use, Says:

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 Yours, etc., R. M. FAUCETT, Pres.

300 BARREL MILL IN ILLINOIS.

MESSRS. NORDYKE & MARMON CO., INDIANAPOLIS, IND.  
*Gents:* We started up our mill in June last year, and it gives us pleasure to say that your Roller Mills are doing splendid work and give us no trouble. Your milling program required no changes, and concerning yields, we get all the flour from the offals, and we sell our best grades in the principal markets of the United States at the highest prices offered for any flour. All the machinery made by you is first-class, and we would not know where to purchase as good.  
 Yours respectfully, DAVID SUPPGER & CO.

125 BARREL MILL IN INDIANA.

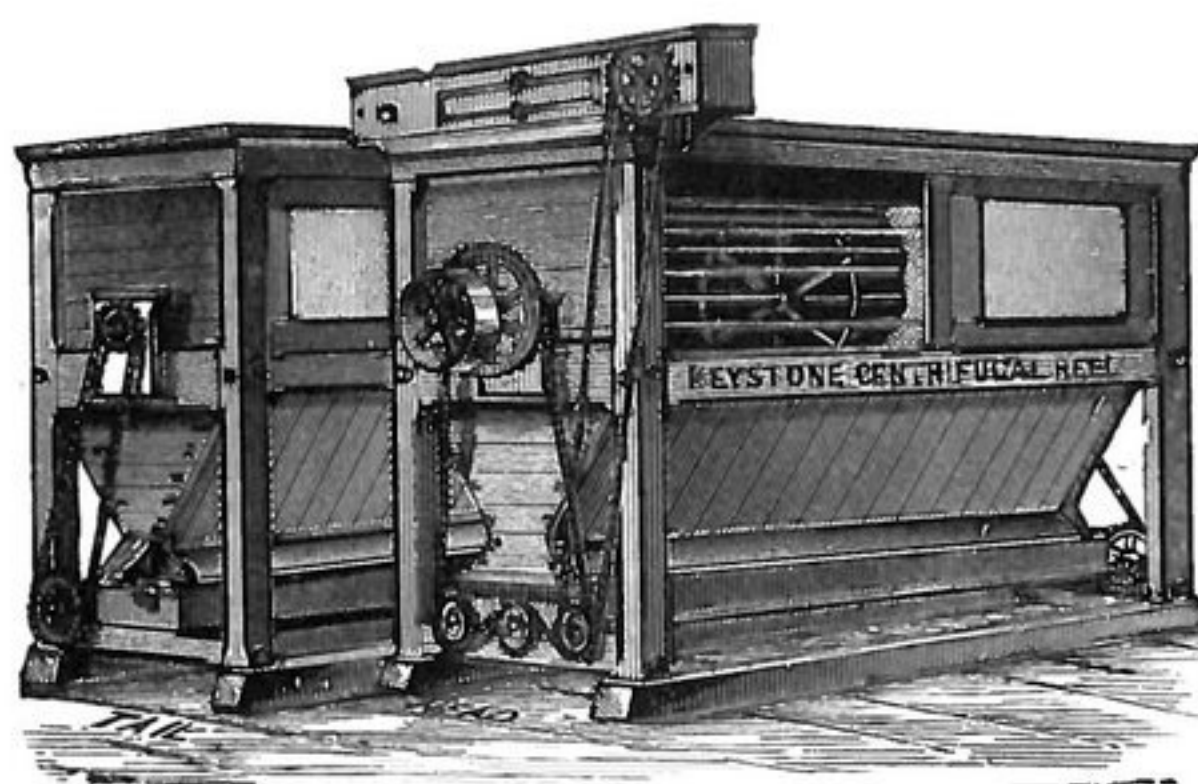
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*Gentlemen:* The 125 barrel All Roller mill you built us has been running all summer, and does its work perfectly. Before contracting with you for this machinery we visited many Roller Mills throughout the West and Northwest, built by the different leading mill furnishers, and from all we could see, those built by you seemed to be giving the best satisfaction, and this is why we bought our machinery of you. Our mill comes fully up to your guarantees, and the capacity runs over your guarantees. The bran and offal is practically free from flour, and our patent and bakers' flour compares favorably with any we have seen elsewhere. I don't think anyone can beat us. Your Roller Machines are the best we have seen; they run cool, and the interior does not sweat, and cause doughing of the flour. Judging from our success, we would recommend other millers to place their orders with you.  
 Yours truly, J. T. FORD.

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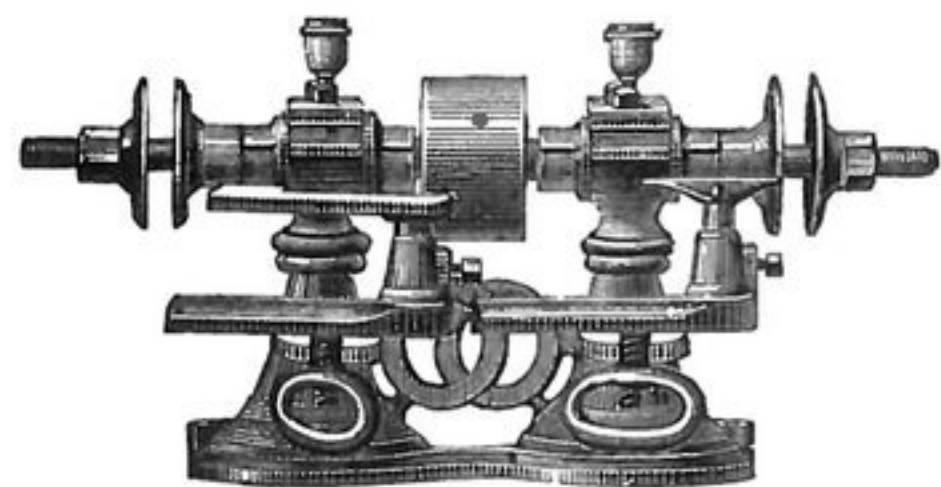
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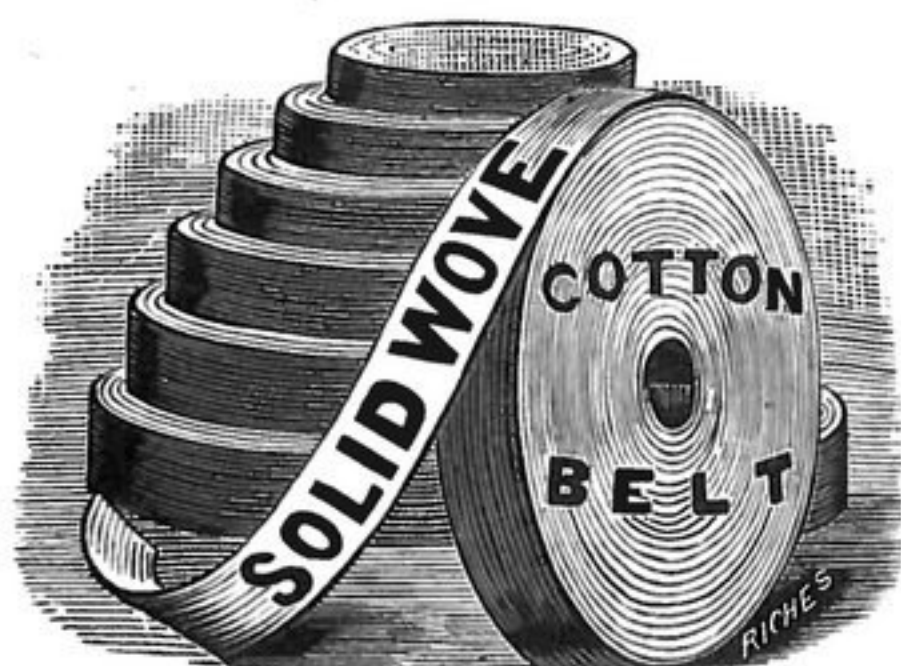
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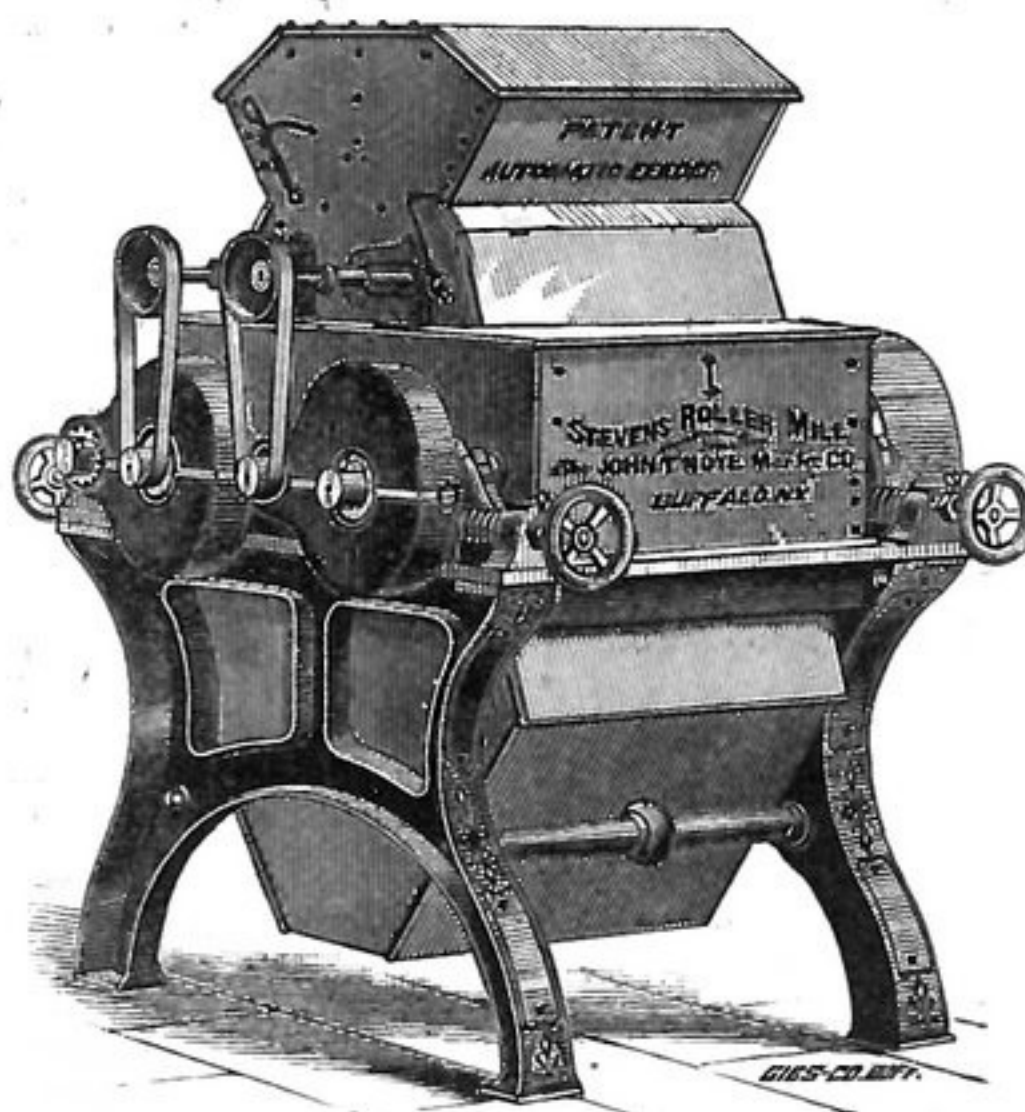
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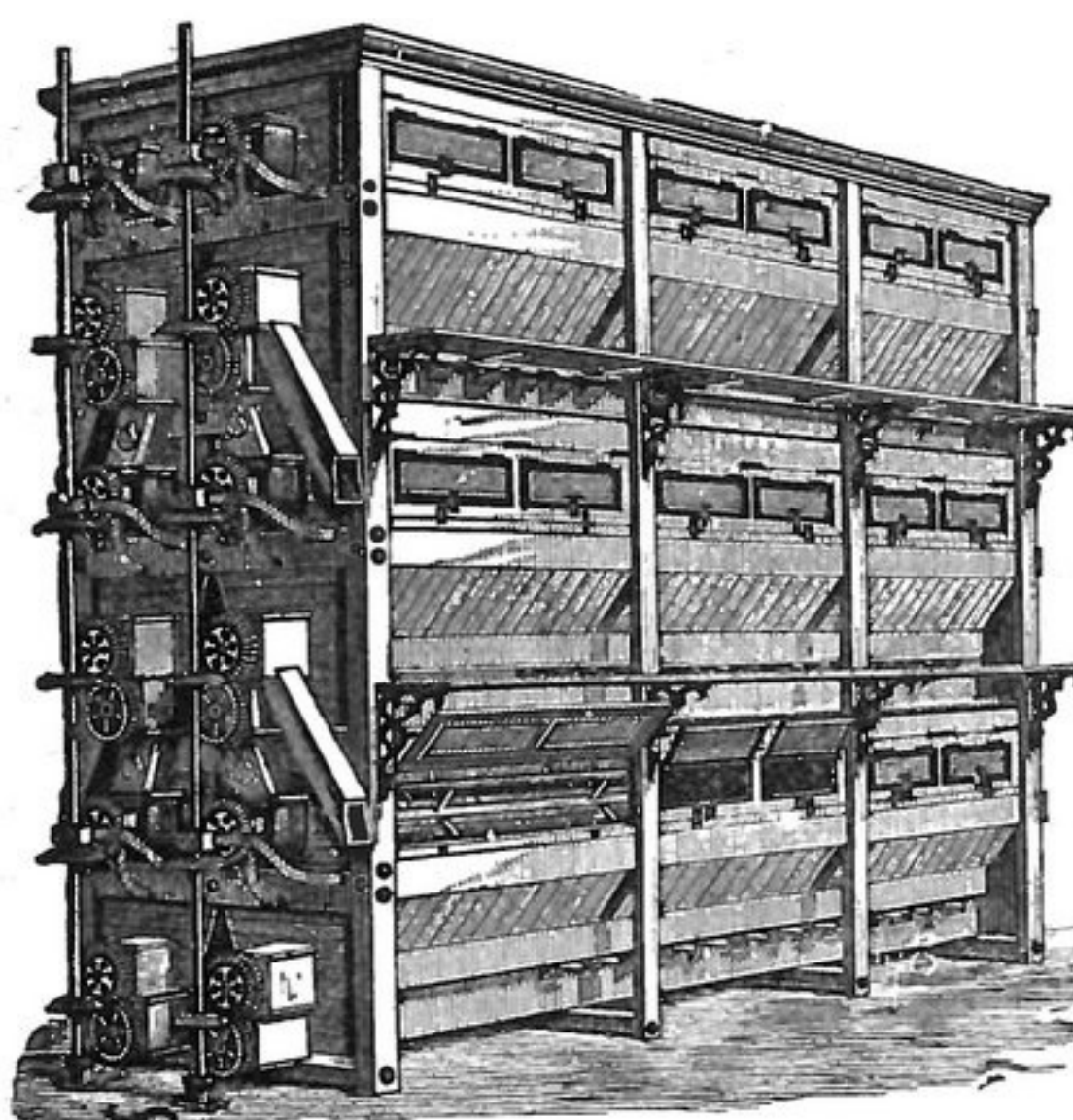


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